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COMMISSION OF INQUIRY INTO THE AIR ONTARIO CRASH AT DRYDEN, ONTARIO

Final Report

Volume III

The Honourable Virgil P. Moshansky
Commissioner







**COMMISSION OF
INQUIRY INTO THE
AIR ONTARIO CRASH
AT DRYDEN, ONTARIO**

This Final Report consists of three volumes: I (Parts One–Four), II (Part Five), and III (Parts Six–Nine and the General Appendices). The table of contents in each volume is complete for that volume and abbreviated for the other two volumes. Seven specialist studies prepared for this Commission have been published separately in a volume entitled Technical Appendices; the contents of the Technical Appendices are given at the end of this volume.



COMMISSION OF INQUIRY INTO THE AIR ONTARIO CRASH AT DRYDEN, ONTARIO

Final Report

Volume III
Parts Six–Nine

The Honourable Virgil P. Moshansky
Commissioner

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This volume has been translated by the translation services of the Secretary of State, Canada, and is available in French.

The aerial photograph reproduced in the endpapers was taken by CASB investigators on March 11, 1989, the day following the crash of Air Ontario flight 1363. It depicts the area of the Dryden Municipal Airport (upper right), surrounding road system, and crash site. McArthur Road runs vertically up the middle of the photograph, curving to the right at about the centre of the book on the right-hand page. (The cleared straight line is a hydro right of way.) Middle Marker Road angles to the left off McArthur in the lower left-hand section. The path of Air Ontario flight 1363 through the trees begins not far from the end of runway 29, and the crash site can be seen just above Middle Marker Road. Many survivors walked out to Middle Marker Road immediately after the crash.

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PART SIX

TRANSPORT CANADA

27 ORGANIZATION

Transport Canada Mandate

The Civil Aviation Role of Transport Canada

Transport Canada is the federal agency responsible to the people of Canada for ensuring that commercial and private aviation activity in this country is carried out effectively at an acceptable level of safety. To quote from Transport Canada's 1990-91 estimates, part III, one of the department's key objectives is "to ensure a safe National Civil Air Transportation System, to attend to the development and operation of the National Civil Air Navigation System for the efficient and safe movement of aircraft and to contribute to the safety and efficiency of Canadian aircraft operating in international and foreign airspace." In simple terms, Transport Canada sets and applies civil aviation safety standards and provides an infrastructure in the form of airports, navigation, radar and communication facilities, and air traffic control services in addition to a number of other facilities and services for both commercial and private aviation.

The Aeronautics Act

The *Aeronautics Act*, R.S.C. 1985, c.A-2, in section 3.2 states: "the Minister [of Transport] is responsible for the development and regulation of aeronautics and the supervision of all matters connected with aeronautics." The Act empowers the minister to administer the air regulations made pursuant to the *Aeronautics Act*. These include the licensing of pilots, aircraft maintenance engineers, and air traffic controllers, the certification of air carriers and airports, and the registration and airworthiness certification of aircraft.

The Act also empowers the minister to take appropriate enforcement action where provisions of the Act, the Air Regulations, or Air Navigation Orders have been violated. Such enforcement action could take the form of a licence suspension, withdrawal of an operating certificate, an administrative fine, or court action. Conspicuous by its absence from the *Aeronautics Act*, however, is specific mention of the minister's responsibility for aviation safety.

The 1981–82 report of the Commission of Inquiry on Aviation Safety by Mr Justice Charles L. Dubin pointed out the lack of specific delineation of responsibility within the *Aeronautics Act* with respect to aviation safety. The report prepared for Transport Canada by the consulting firm of James F. Hickling in September 1990, “Evaluation of Aviation Regulation and Aviation Safety Programs,” again addressed this apparent anomaly at some length.

A reading of the various orders and regulations in their entirety reveals an implicit intent, however, that the minister and Transport Canada are responsible for aviation safety. Indeed, this acknowledgement is reflected in the role and mission statement of the department’s Aviation Group: “The mission of the aviation group is to provide a safe and efficient civil aviation system.” Further, in a recent judgement of the Federal Court of Appeal in *Swanson et al. v. The Queen in Right of Canada*, 80 D.L.R. (4th) 741 (also known as the “Wapiti” case), Linden J.A. agreed with Justice Walsh of the Federal Court of Canada, Trial Division, when he stated:

The *Aeronautics Act* and Regulations made thereunder if not explicitly imposing a duty of care of the general public, at least do so by implication in that this is the very reason for their existence. The flying public has no protection against avaricious airlines, irresponsible or inadequately trained pilots, and defective aircraft if not the Department of Transport, and must rely on it for enforcement of the law and regulations in the interest of public safety.

I am of the view that such an important duty should be clearly delineated and, accordingly, that the *Aeronautics Act*, which is the foundation of ministerial responsibility for civil aviation in Canada, should be specific in defining the minister’s responsibilities for aviation safety. This is a flaw that should be remedied by appropriate amendments to the *Aeronautics Act*. A finding and recommendation in that regard is contained in chapter 37, Safety Management and the Transport Canada Organization.

The Air Regulations and Air Navigation Orders (ANOs)

The *Aeronautics Act* authorizes the minister, through Transport Canada, to perform certain functions pertaining to civil aviation. It also enables the Governor in Council and the minister to make regulations and orders that will assure that the provisions of the Act are addressed. These are called the Air Regulations and the Air Navigation Orders (ANOs).

Part VII of the Air Regulations sets out the rules that define the conditions under which a commercial air service may be operated. For example, Air Regulation 700 states that "No person shall operate a commercial air service in Canada unless he holds a valid and subsisting certificate issued by the Minister certifying that the holder thereof is adequately equipped and able to conduct a safe operation as an air carrier." This rule requires that before a carrier can operate in Canada as a legally sanctioned commercial airline, it must meet the requirements set out by Transport Canada in the Air Regulations and Air Navigation Orders. Transport Canada has a corresponding obligation to ensure that the applicant carrier meets the required standards prior to issuing an appropriate operating certificate.

The Air Regulations enable legal standing to other documentation that is too voluminous or technical to be contained in the regulations. For example, Air Regulation 211(1) states that the minister may initiate publication of an airworthiness manual and an engineering and inspection manual. These documents set out airworthiness, maintenance, and inspection standards that must be complied with before an airworthiness certificate for an aircraft may be issued and retained. Air Regulation 403(2) states that every person applying for the issue or renewal of a licence as a flight crew member, an aircraft maintenance engineer, or an air traffic controller shall comply with the requirements applicable to that licence that are set out in volumes 1, 2, and 3 of the Personnel Licensing Handbook.

Air Navigation Orders are generally structured in a form analogous to the Air Regulations but, like the manuals referred to above, provide greater technical detail. Of particular interest to this Inquiry was ANO Series VII, No. 2, which sets out standards and procedures for air carriers using large aircraft. This was the primary operating standard or benchmark that Transport Canada applied to Air Ontario's F-28 operation.

The director-general, aviation regulation, Mr Weldon Newton, testified that efforts are being made by Transport Canada to merge the existing Air Regulations and Air Navigation Orders into one level of legislation. A great deal of evidence was heard, however, pertaining to an apparent lack of progress in the decade-long period since the 1981 recommendation of the Dubin Inquiry for the adoption by Canada of the United States design and operating rules as a model for the Canadian regulatory framework.

Structure of Transport Canada

Major organizational changes and associated changes in reporting relationships occurred within Transport Canada on April 1, 1991. These changes are discussed in relevant sections of my Report.

Transport Canada is one of the largest federal government departments in terms of size and it is one of the more complex in terms of areas of responsibility. Some idea of the size and scope of this department can be gleaned from the evidence given by Mr Ramsey Withers, the department's deputy minister from 1983 to 1988:

- A. While it is correct to say that the department itself was about 20,000 individuals, one is dealing with the national transportation system and, therefore, there are many others involved, an extensive number of Crown corporations.

If I recall accurately at my time about 20 Crown corporations that formed part of the whole system.

(Transcript, vol. 164, p. 4)

Transport Canada has responsibility for the regulation and, in some cases, the actual operation of various transportation components encompassing air, surface, marine, and even pipelines. This Report will focus attention on that area of the department responsible for civil aviation and, in particular, aviation safety.

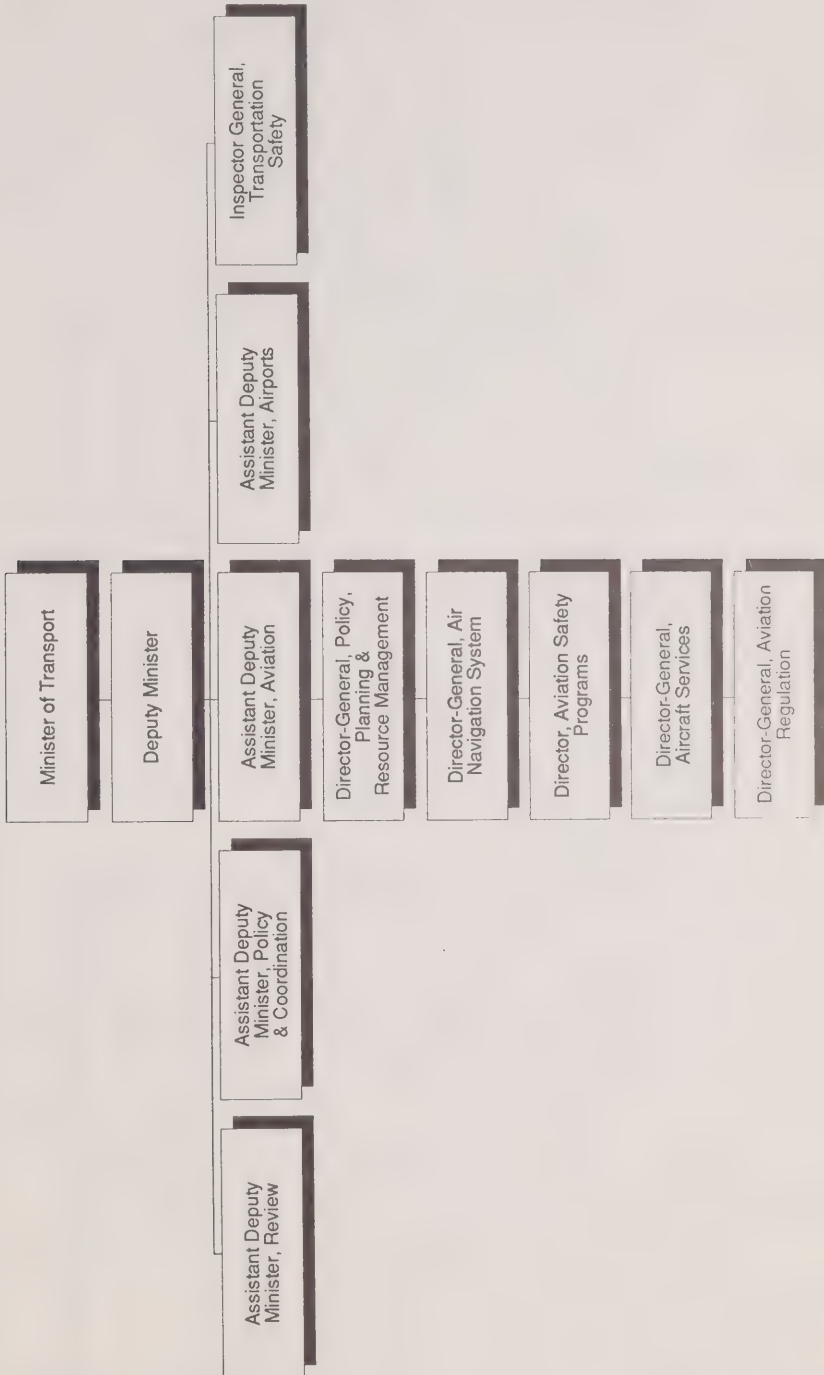
On March 10, 1989, there were two groups within Transport Canada that were of particular interest to this Commission: the Aviation Group, reporting to an assistant deputy minister, aviation, and the Airports Authority Group (Airports Group), reporting to an assistant deputy minister, airports. Within the Aviation Group there were four principal directorates, namely policy, planning, and resource management; air navigation system; aviation regulation; and aircraft services; as well as one branch – that of aviation safety (figure 27-1).

Of primary interest during the Inquiry was the Aviation Regulation Directorate, particularly the Flight Standards and Airworthiness branches at both the headquarters and the regional level. Figure 27-2 sets out the organizational structure and the reporting relationships of the Aviation Regulation Directorate.

Aviation Group

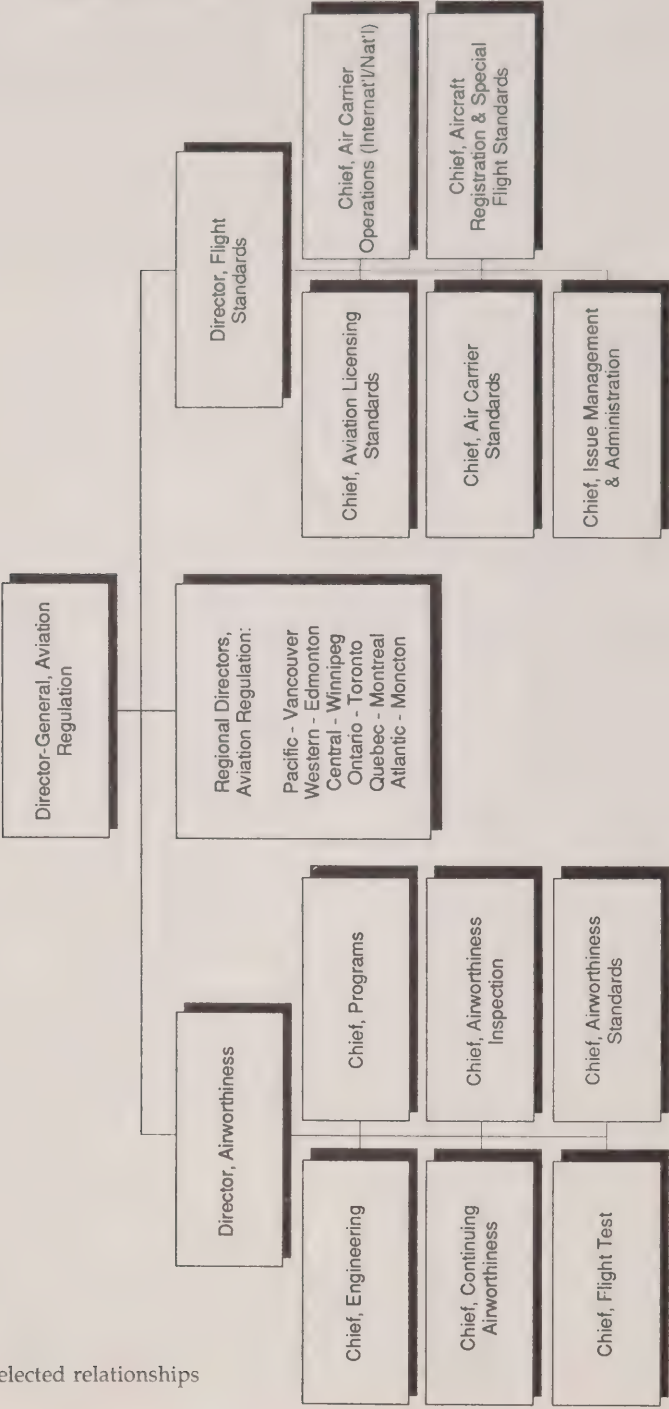
The objective of Aviation Group is “to ensure a safe National Civil Air Transportation System, to attend to the development and operation of the National Civil Air Navigation System for the efficient and safe movement of aircraft and to contribute to the safety and efficiency of

Figure 27.1 Transport Canada Organization, March 10, 1989*



* Depicts selected relationships

Figure 27.2 Transport Canada: Aviation Regulation Directorate, March 10, 1989*



* Depicts selected relationships

Canadian aircraft operating in international and foreign airspace.”¹ Aviation Group, then, has three main functions: safety regulation, safety promotion, and the provision of facilities and services to allow for the operation of aircraft in both visual and instrument weather conditions.

From the perspective of safety regulation, the Aviation Regulation Directorate develops and promulgates safety-related legislation, regulations, and standards. It licenses pilots, aircraft maintenance engineers, and air traffic controllers. It certifies aircraft and aeronautical products that meet the required standards of airworthiness. It certifies commercial air carriers and airports that meet safety standards. Finally, it enforces the *Aeronautics Act*, Air Regulations, and Air Navigation Orders through investigations, warnings, licence or certificate suspensions, administrative fines, and prosecutions.

Aviation Regulation Organization

The structure and activities of the Aviation Group were assessed in the course of this Inquiry. Following the conclusion of the hearings, it was learned in May 1991 that Mr David Wightman, the assistant deputy minister, aviation, was restructuring Aviation Group at both the headquarters and the regional levels. The effect of successive structural changes from a safety standpoint, including the April 1, 1991, reorganization, are addressed in chapter 37, Safety Management and the Transport Canada Organization.

Within the Aviation Regulation Directorate there are two branches whose responsibilities are linked most directly to the Transport Canada issues with which this Inquiry was primarily concerned: Flight Standards and Airworthiness.

Flight Standards Branch The headquarters Flight Standards Branch has responsibility for personnel licensing standards for flight crews, the registration of aircraft, as well as certification and operating standards for air carriers. In addition, the Air Carrier Certification Manual, the Personnel Licensing Procedures Manual, and related guidance material are produced by staff from the Flight Standards Branch. Other specific functions of the Flight Standards Branch include approval of air carrier flight operations manuals; minimum equipment lists; training programs for both flight and cabin crews; as well as setting policy related to passenger safety, pilot proficiency checks and in-flight inspection procedures, and air carrier audit procedures. The above list of responsibilities and duties is by no means exhaustive.

¹ Transport Canada, *1990-91 Estimates*, part III, p. 2-51

In a general sense, Flight Standards headquarters is responsible for setting the policy and uniform standards that are applied by the regional offices in the day-to-day regulation of civil aviation. An exception to this general rule occurred in 1988, with the establishment under the Flight Standards Branch of the Air Carrier Operations (International/National) Division, commonly referred to as the Seventh Region. This division performs direct inspection duties, using air carrier inspectors based in Ottawa, Vancouver, Toronto, and Montreal who are qualified on large transport aircraft. In addition to their hands-on inspection duties, these air carrier inspectors are required to approve flight operations manuals, minimum equipment lists, and air carrier training programs. The rationale that led to the introduction of this operational headquarters division was described in evidence by Mr Donald Sinclair, a former Ontario Region manager of air carrier operations:

- A. Well, I believe it was done to establish one contact point only with the people who had the expertise resident with them to provide the surveillance and the service.
- Q. Whereas previously they [the carriers] may have come under your jurisdiction, but you would have to then borrow expertise from headquarters to service them properly; is that right?
- A. That's correct.

(Transcript, vol. 142, p. 13)

This blending of staff and line functions proved to be less than satisfactory as air carrier certification demands increased substantially in the latter part of the 1980s. A great deal of evidence focused on Economic Regulatory Reform (ERR), introduced in 1984–85, and its effect on staff work, including the examination and approval of operations manuals and minimum equipment lists.

Airworthiness Branch Like their Flight Standards counterparts, the headquarters Airworthiness staff develop airworthiness standards policies and procedures. The areas addressed by this branch include standards and procedures for approval of air carrier maintenance programs, as well as inspection and approval of maintenance organizations and facilities required by a carrier applying for an operating certificate. The branch also sets standards and policy pertaining to the approval of organizations designing and manufacturing aeronautical products.

A major operational role performed by the Airworthiness Branch is the examination, testing, and certification of new aircraft types either designed and manufactured in Canada or imported into Canada. Airworthiness inspectors from headquarters also conduct audits on companies that manufacture aviation products and on major repair and

overhaul facilities. In both the Airworthiness and Flight Standards branches, headquarters inspectors also participate in national audits of air carriers. The inability of such inspectors to perform all of their duties during the post-ERR era was the subject of much evidence.

Airports Authority Group

The objective of the Airports Authority Group is "to ensure the availability and reliability of a safe, secure and efficient national civil airports system in Canada."² Transport Canada operates 8 major airports and 97 national, regional, and local airports. The primary function of the Airports Group is the formulation of policy and standards for airports and the operation and maintenance of airport facilities and services in Canada, including the provision of terminal facilities. Of particular interest to this Inquiry relating to Airports Authority Group were those areas of responsibility associated with crash fire rescue, aircraft refuelling standards and services, and de-icing facilities.

Regional Organizations

There are six Transport Canada regional offices in Canada (see figure 27-2). The regional director and his managers were responsible for Transport Canada air carrier operations and airworthiness programs that affected carriers residing in their region. The exceptions to such regional responsibility were the operations of the major carriers assigned to the headquarters Air Carrier Operations (International/National) Division. Airworthiness responsibilities for those same major national and international carriers, however, continued to rest with the airworthiness inspection organization in the region in which the carrier resided.

In the course of the Commission hearings it became increasingly obvious that the lines of responsibility in air carrier inspection and certification were fragmented. This fragmentation precluded effective coordination between the overlapping operations and airworthiness areas.

District Offices

District offices, reporting to regional offices, were created to provide improved services to and surveillance of the aviation industry in areas where the level of aviation activity was high but where there was no Transport Canada civil aviation presence. As the licensing and certifi-

² Ibid., p. 2-71

cation demands escalated dramatically during the latter part of the 1980s in response to deregulation of the airline industry in Canada, the number of district offices was increased to approximately 20. These offices are located in such places as Victoria, Kelowna, Calgary, Saskatoon, London, Timmins, Quebec City, and Halifax.

These district offices deal primarily with airworthiness issues, and district office managers report to the regional managers of airworthiness. In some centres where demand requires it, air carrier and licensing inspectors are also resident in the district offices. These inspectors report to the regional manager of air carrier operations or the regional manager of licensing.

In summary, Transport Canada is a complex organization serving a dynamic industry which experienced tremendous growth during the 1980s. Concurrent with such growth was the introduction of government policies designed to bring about deregulation and deficit reduction. The aviation sector of the department undertook organizational changes intended to meet the associated challenges. It is beyond the scope of this Inquiry to assess the effectiveness of such organizational changes except as they may have had an impact on aviation safety. My remarks in the following chapters of Part Six are limited to that extent.

28 CONDITIONS AT TRANSPORT CANADA IN THE EARLY 1980s

Concerns about unmanageable workloads generally, and insufficient numbers of air carrier and airworthiness inspectors and support staff specifically, were raised as far back as 1982 by the Canadian Air Transportation Administration (CATA), the predecessor before the 1985–86 reorganization of Transport Canada's Airports and Aviation groups.

The Commission of Inquiry on Aviation Safety headed by Mr Justice Charles L. Dubin was established in 1979 with a broad mandate to advise the minister of transport on issues relating to the safety of the civil air transportation system. The Commission's report, issued in three volumes in 1981–82, pointed out the need for increased staffing in several areas in Transport Canada, particularly in the inspection of air carrier maintenance and operations.

A document released by Transport Canada in November 1984, Final Report, A-Base Review, Volume II, Regulatory (TP 5876E), provides insight into the capacities and capabilities of the Aviation Regulation Directorate in the aftermath of the Dubin Inquiry. The document resulted from the concern of the Treasury Board that CATA's Human Resources Requirements Plan, submitted to the Treasury Board at its meeting of October 28, 1982, did not demonstrate clearly that the staffing requirements (person-years) specified in that plan represented the minimum number of people needed to carry out the program.

In response to these concerns, Mr Gordon Sinclair, administrator of CATA, put in place an A-base review (a review of all ongoing programs within the air administration) to identify the most efficient and economical level of resources required by CATA to meet its mandate, taking into account the changes initiated in response to the report of the Dubin Inquiry. A project review committee was set up to oversee and review the recommendations of the A-base review team. The members of this committee consisted of a director from the Treasury Board secretariat, Transport Canada's assistant deputy minister, personnel, and the director-general, review. In other words, with the exception of Mr Sinclair, the management of the review process was attended to by individuals external to CATA.

The process of examination to which CATA was exposed was exhaustive. The authority and mandate that CATA claimed for each task

was checked and validated by aviation law experts from McGill University. Task times were established and challenged by the review team members through comprehensive on-site evaluations, audits, comparisons, and recordings.

The review team found that the Aviation Regulation organization had significant shortages in resources and that these shortages were adversely affecting the organization's ability to conduct its affairs efficiently and to ensure an adequate level of safety. It also noted a number of activities where efficiency and effectiveness could be achieved through changes in existing practices. The A-base review team recommended that the Aviation Regulation organizational unit for fiscal year 1983–84 be allocated an additional 117.5 person-years. For those groups reviewed within the Aviation Regulation Directorate, using fiscal year 1984–85 as the base, an additional 52 person-years were recommended.

These recommendations did not include additional resources that would be required as a consequence of the deregulation that allowed a dramatic increase in activity in the air carrier industry. The section of the A-base review dealing with the inspection of air carriers offers significant findings as to the state of Transport Canada's capability in this area in 1983 and 1984. It cited the following results:

- a) The resource allocations to the regional Air Carrier Operations divisions have been insufficient to meet the required workload. The shortfall has, to varying degrees, affected the quantity and quality of most tasks. Bases have been inspected only 70 per cent of the required number of times and only by omitting certain procedural steps.
- b) The initial inspections of new carriers are frequently delayed and the initial inspections of new aircraft and equipment are often postponed until the next annual inspection. As a result, aircraft can be operated in commercial transport service without meeting all the required standards ...
- ...
- d) The level of administrative support provided to the function results in professional staff spending significant amounts of time on clerical and stenographic activities. This, of course, aggravates the problem of insufficient time to perform primary tasks.

(From para. 2.8.17, pp. 61–62)

The review team also identified shortfalls in resources that generated flight safety concerns: "Lack of an adequate increase in resources will adversely affect aviation safety through continuation of unsatisfactory performance as detailed in paragraph 2.8.17 above" (p. 62). They warned that "[c]ontinued provision of insufficient resources for this function will result in a perpetuation of the undesirable if not unacceptable, situation

which exists as a result of 'corner-cutting' by inspectors. Their attempts to cope with an unmanageable work-load, and in continued non-completion of required inspections all of which could have an adverse effect on flight safety" (p. 64).

Specific findings and expressions of concern about the lack of resources and its impact on aviation safety made by the review committee in 1984 in relation to the situation in 1983 can be repeated, word for word, to describe the situation that has existed in the Aviation Regulation Directorate since 1984, and, in fact, as it is in 1992. As early as 1983-84, Transport Canada's Aviation Regulation body and, in particular, the air carrier certification and inspection groups were unable to fulfil effectively their mandated tasks. The evidence shows that during the 1980s Transport Canada did not have sufficient human resources to discharge its mandate. Further, the evidence demonstrates that Transport Canada had been repeatedly warned at the highest levels of bureaucracy about this unsatisfactory state of affairs.

ECONOMIC DEREGULATION AND DEFICIT REDUCTION

Throughout the hearings of this Inquiry into the Dryden accident, I heard repeated concerns expressed by Transport Canada witnesses regarding their inability to respond effectively as regulators to an increasing demand for air carrier certification, inspection, and surveillance services. According to the witnesses, the certification, inspection, and surveillance workload created by a rapidly changing air carrier industry was not matched by a commensurate increase in resources for Transport Canada's regulatory agency. The resource squeeze stemmed from the almost simultaneous introduction of two federal government policies in 1984, namely Economic Regulatory Reform of the air carrier industry and deficit reduction, a program imposing fiscal restraint on federal government services. The combined effect of these two policies created a difficult set of circumstances for the Transport Canada personnel responsible for air carrier safety.

Economic Regulatory Reform

The changes in regulation of the air carrier industry in Canada followed similar activity in the United States by several years. In 1978 the United States embarked upon a program of deregulation of its aviation industry, removing air carrier route protection as a regulatory requirement and opening the marketplace to any domestic carrier desiring to compete. The United States government's objective was to allow increased competition within the air carrier industry that would result in substantially lower air fares for the consumer.

A similar move was contemplated in Canada when the minister of transport, the Honourable Lloyd Axworthy, on May 10, 1984, announced a new Canadian domestic air policy appropriately termed "Liberalization of the Canadian Air Transportation Industry." Mr Ramsey Withers, who was then deputy minister of transport, gave evidence before this Commission. He summed up the policy proposal as follows:

- A. And, really, the gist of the announcement was that the Minister would change, alter or vary any decision that the Canadian Transportation Commission might take with respect to denying the right or the authority for an air carrier, Canadian air carrier,

to serve two points in Canada. New Section 64 of the National Transportation Act [sic] [was] to do that.

And so this had the impact of then saying, all right, carriers, away you go. You can, if you want, these routes that are, you know, designated between city pairs in Canada for one carrier that in the future, two, three or four even might be able to provide service. So that happened in 1984.

(Transcript, vol. 164, p. 8)

Transport Canada's Ontario Region office reacted to the Axworthy proposal on deregulation by initiating an independent assessment into the potential impact of the policy. Of particular concern was the ability of the Aviation Regulation division to fulfil its mandate of ensuring that the air carrier industry was operating in compliance with safety standards. This assessment, entitled "Impact of Deregulation" (May 10, 1984), cited a number of expectations as a consequence of the new policy that, in retrospect, were remarkably accurate.

On July 24, 1984, these concerns were communicated to Transport Canada in Ottawa in a memorandum titled "Deregulation - Regional Impacts" from the Ontario regional administrator, Mr Douglas Lane. One of the conclusions of the accompanying assessment report was that there were already, in 1984, some indications of a heavier workload associated with deregulation due to a greater number of air carriers, mergers of existing carriers, and increases in the number of aircraft types being operated. The report warned that significant further increases in workloads were almost certain to be experienced in air carrier certification, airworthiness inspection, personnel and aircraft licensing, and enforcement and surveillance.

Mr Lane's memorandum to Transport Canada senior management was a clear warning that certain steps needed to be taken immediately to deal with the escalating workload, beginning with staffing of the regulatory function to the A-base level. He stated in his memorandum:

[T]here needs to be discussion and decision at the most senior levels on the priorities of accommodation and tasking together with acceptable levels of staff diversions in all elements of the organization from certification through surveillance in the regulatory functions to CFR in the airport functions for each of new, expanding and existing services. As an immediate and minimum first step, however, staffing the Regulatory function to the accepted A-Base levels should be authorized.

(Exhibit 1147)

On August 21, 1984, the administrator of CATA, Mr Gordon Sinclair, responded to Mr Lane's memorandum by congratulating him and citing it as "an excellent managerial effort to cope effectively with change"

(Exhibit 1146, pp. 2-3). Mr Sinclair went on to say that he agreed that obtaining adequate regulatory resources was a top priority:

I agree strongly with several of your key points ... Specifically, I agree that:

- (1) Obtaining adequate additional regulatory resources is a top priority. We must maintain adequate surveillance and we must process carrier applications and proposals sufficiently quickly that CATA does not become the bottleneck obstructing quick implementation of the new Canadian air policy, yet without lowering our standards.

While the headquarters reaction was positive, I could find no substantive response to Mr Lane's proposal. In fact, the Ontario Region was left with its existing staff to cope with ever-increasing demands for certification and inspection services as the air carrier industry sought to reorganize itself in an economically deregulated operating environment.

In late 1984 a change in government occurred. The new transport minister, the Honourable Donald Mazankowski, modified not only the name of the air carrier deregulation policy, which now became Economic Regulatory Reform or ERR, but also its scope, which was expanded to include rail and the trucking industry. In the summer of 1985 the government produced a White Paper called *Freedom to Move: A Framework for Transportation Reform*. The essence of the paper is as follows:

The Government wants a new legislative framework for Canadian transportation that will minimize government control over shippers and carriers while ensuring that the public interest is met. Competition will be emphasized. Dispute resolution will be streamlined and made less cumbersome. A new Regulatory Agency will be smaller and more accessible. The emphasis will be on providing transportation services at the lowest possible cost, subject only to the overriding priority of a high level of safety.

(Exhibit 933, p. 2)

In response to concerns expressed by groups such as the Canadian Air Line Pilots Association that ERR would have a detrimental effect on safety, the minister of transport offered the following commitment in his opening statement in *Freedom to Move*:

I would like to indicate unequivocally that the Government will neither propose nor permit any economic regulatory reform that might be detrimental to safety standards.

In a December 1985 brief submitted to the House of Commons Transport Committee, the Canadian Air Line Pilots Association predicted that under deregulation, efficiency and profit would become all-important to the carriers and that the self-policing aspect of the industry would fade. The brief stated:

The level of aviation safety in Canada is, ostensibly, the responsibility of the Minister of Transport, who, through his Department, is charged with establishing certain standards and monitoring the industry to ensure compliance. In practice, the level of safety we have enjoyed in Canada has been dependent on air carriers' willingness and ability to operate to standards well above the minimum demanded by the Department of Transport, and on the efforts of dedicated individuals. Under deregulation, the Department of Transport will, of course, continue to monitor and enforce the same minimum safety standards, but as "efficiency" and profit become all important, the self-policing aspect of the industry will fade. Capital will be forced to trade as closely to the marginal line of safety as the enforcement agency will permit.

The brief further cautioned that the airlines' efforts to reduce costs in order to compete effectively would put negative pressure on safety standards:

In Canada, "Freedom to Move" anticipates new entrants in the airline industry, all of whom will require an operating certificate from the Department of Transport after investigation as to their fitness. "Freedom to Move" also anticipates that airlines will have to reduce their costs to compete effectively, which will put negative pressure on safety standards. At the same time we see a reduction in air inspectors – but are assured that safety will not suffer.

It is noteworthy that the auditor-general, in his report to the House of Commons for the fiscal year ending March 31, 1985, stated that "none of the (Transport Canada) regions was able to inspect all carriers in its jurisdiction at least once a year."

Deficit Reduction: Downsizing

A major factor that contributed to the difficulties encountered in the Aviation Regulation Directorate during the latter part of the 1980s can be traced back to late 1984, shortly after deregulation of the air carrier industry had first surfaced as a government policy. A restructuring of the industry was by then beginning to get under way. Over the next three to four years demands for increased certification, inspection, and

surveillance resulting from mergers, realignment of routes, and the introduction of new carriers and new equipment would be unprecedented. When questioned on the witness stand about the implementation of the policy set out in the *Freedom to Move* paper, Mr Withers, former deputy minister of transport, referred to the dilemma facing the Aviation Regulation Directorate as a result of the two incompatible government policies, ERR and deficit reduction:

- A. You can't talk about it [ERR] without talking about another government policy because while I said a moment ago that, yes, we would implement the policy laid down to us by the Minister of Transport, one is essentially saying in these major policy initiatives, that one is implementing the policy of the government, of the Ministry, of the decisions, the policy decisions of the government.

Yet, another high priority policy decision of the government was deficit reduction. And the first blush of deficit reduction measures hit in Mr Wilson's economic statement of November 1984. And these – these measures that were in that impacted upon the department.

The department took a second blow in terms of deficit reduction targets in the May 1985 budget which was, in financial planning terms, is hard on the heels of November '84.

(Transcript, vol. 164, pp. 18–19)

Memorandum of Understanding, 1985

A memorandum of understanding (MOU) reached in 1985 between Transport Canada and the Treasury Board was to have great influence on operational groups within the department over the long term. Mr Kenneth Sinclair, assistant deputy minister, policy and coordination, in his testimony before this Commission described the MOU as follows:

- A. Yes. The Memorandum of Understanding which emerged from the budget of early 1985, I believe, the M.O.U., sir, was an agreement, an accountability agreement, between the Deputy Minister and the Treasury Board – and the Minister, I would say, and the Treasury Board that in return for the necessary discretion and authority to manage within its resources in a more unrestricted manner than is normal in the public service, the department would be asked over a five-year period to reduce its annual expenditures by approximately \$400 million.

So that at the end of the fifth year our operating reference level would be \$400 million less than at the beginning and you would gradually work down. And that the department in terms of person-years would have reduced its size by approximately

1680 person-years, and that would represent about – approximately 7 percent of the department's resources.

(Transcript, vol. 165, pp. 44–45)

Program Control Board

Mr Withers testified that he became deputy minister of Transport Canada in 1983. The secretary of the Treasury Board advised him at the time that Transport was considered to be a “fat” department with substantial room for overhead reduction. A subsequent consolidation of the department's financial and administrative services was undertaken. In 1984 the Program Control Board (PCB) was set up under the direction of Mr Withers.

Through the deputy minister, the Program Control Board managed the resources of Transport Canada, a department that in early 1991 involved some 21,000 person-years with an annual budget of some \$3.2 billion.

The evidence of Mr Withers highlights both the origins and the intended function of the PCB. Mr Withers stated that in his previous position as Canada's chief of the defence staff, he had used a similar mechanism to appropriate resources at the Department of National Defence (DND). Referring to the DND Program Control Board, he testified:

- A. And the Program Control Board had the task of taking reference levels which were never enough to meet the operational requirements, and making them fit within the envelope, if you will, of that – of the money that was going to be provided to Defence.

That has been an extremely successful method of resource allocation. And, of course, having chaired the board for three years and then as Chief of Defence Staff, having had it – its work serve me, I was very interested in doing exactly the same thing in Transport when I saw, number one, we were faced with substantial overheads; number two, we got a hit November 1984 with the economic statement; number 3, we got a bigger hit in May 1985. Then we – we did set up the Program Control Board, and if I recall correctly, I think we had it running by – about the time that the first hit came out, the November '84 statement.

And its role was to – well, I want to back up again a bit from that. Knowing the status or, if you will, the image that we had in Treasury Board, one of the things that we definitely wanted to achieve was credibility. In large measure, we had advocated the responsibility to challenge to the Treasury Board.

National Defence had done that 15 years previously, and National Defence rebuilt credibility with its Program Control Board to show that anything that was coming forward from

National Defence was really a requirement, and you can count on it being valid and bang. We wanted to use the same devices to get our credibility, to take our responsibility in-house.

(Transcript, vol. 164, pp. 20–21)

Mr Kenneth Sinclair, who has long experience on the PCB both as a member and as chairman, described in his evidence the purpose of the PCB:

- A. To ensure that the department was establishing and maintaining its credibility in terms of the justifications and the ... qualifications required in putting forward submissions to the Treasury Board through the Minister to get the Department the resourcing it requires.

The Deputy Minister also expected the group to – this being the Program Control Board and the secretariat, to be of assistance to the groups in ensuring that all of the elements required in satisfying the central agency were, indeed, fully put forward on a best-case basis.

The Deputy made it very clear that he had an order of priority that was to be used in the assessing of all submissions put forward by the various groups, and that the most pressing priority that was to be given top consideration for the allocation of resources was firstly, safety, security and the health of Canadians.

Recently, we would add to that the environment.

(Transcript, vol. 165, pp. 9–10)

Nielsen Task Force Recommendations, September 1985

In the fall of 1984, one of the government's first actions was to set up the Ministerial Task Force on Program Review under Mr Erik Nielsen to review all government programs and to recommend cuts and consolidations. Nineteen study teams were established to look at different areas. The task force study report dealing with transportation programs recognized the air safety concerns brought out in the A-base review. It recommended as follows:

- a. Immediately increase the resources devoted to licensing, certification and enforcement in the regulation of air safety to the levels advocated in the recent A-base review so as to ensure that the travelling public is protected, and that the industry is offered a reasonable level of service having regard for current and proposed economic regulatory reform.

- b. Pursue the development of meaningful workload determinants to ensure resources keep pace with requirements.

(Economic Growth: Transportation, A Study Team Report to the *Task Force on Program Review* (1985), p. 64)

The study reiterated the need for additional funding of the regulatory arm to assure aviation safety in a deregulated environment:

It seems apparent that the commitment by the federal government to assure aviation safety, particularly in light of the initiatives to reduce economic regulation, will require additional resources. The availability of these resources within the department's proposed budget, i.e. after the significant reductions mentioned in the May 1985 budget paper, has not been obvious. Moreover, the department is going through an internal downsizing exercise that has the potential for exacerbating the shortage in resources that currently exists.

(Exhibit 1145, tab 4, p. 127)

Federal Aviation Administration (FAA) Experience, September 1985

By September 1985 there was, within the Aviation Regulation Directorate in Ottawa, sufficient awareness of a potential problem to cause its management to undertake a number of field trips to the United States. The purpose of the trips was to obtain the benefit of the experience gained by their FAA counterparts after six years of United States air carrier deregulation. The results of these visits are reflected in a trip report prepared by Mr Donald Douglas, then Transport Canada's director of licensing and certification.¹ Mr Douglas's testimony before this Inquiry vividly reflects the FAA perception of the impact of deregulation on that organization, including a doubling or tripling of its certification workload:

Q. Now, generally, what did they tell you?

A. They told me that there was a very, very big workload thrown on them in the certification area, and there was real urgency to expedite things, new people were wanting to start up airlines without any notice, some of the people that wanted to start up new airlines had never been in the airline business before, and they didn't really know what was involved.

¹ "Notes on a CATA Visit to the FAA Headquarters in Washington, D.C. – September 20, 1985" (Exhibit 1104)

And the FAA workload doubled or tripled in certification and trying to educate new carriers as to what was required. A very heavy workload.

(Transcript, vol. 143, p. 42)

The observations contained in the report prepared by Mr Douglas on his Washington trip are revealing. The biggest mistake that the FAA made, according to one of their managers, was its failure to anticipate the tremendous increase in certification and inspection workload that would be generated by deregulation. In addition, the substantially lower experience and competency levels of new entrants to the air carrier industry imposed a tremendous extra workload on the air carrier inspectors:

In [the view of the FAA], "bottom line" drives the operator [carrier] today. This was not the case prior to deregulation ...

... Instances of operators moving into equipment [aircraft] that they were not prepared to handle exist. This resulted in problems with maintenance management. In many cases, it was not possible for the many carriers to find maintenance people with the proper background. It was somewhat easier to find pilots, however, this also resulted in a great need for training.

The demand for training and monitoring of training became very time consuming for FAA people and combined with this, many management people in the new companies were not familiar in any way, shape or form with aviation operations and this created a tremendous work load for air carrier inspectors.

(Exhibit 1104)

Mr Douglas's focusing of attention on the doubling and tripling of the certification workload experienced by the FAA after deregulation should have been a clear and salutary warning to senior management in Transport Canada who were charged with the responsibility of fulfilling the minister's commitment not to permit ERR to compromise safety standards.

It is interesting to note that Mr Douglas makes the following statement in his report on the Washington trip: "At the time of deregulation in the United States, there was a major political thrust to reduce the size of government and this complicated the work of the FAA." There is no doubt that the situation in Canada to a large extent paralleled the American experience. The fact that the FAA experience, as reported by Mr Douglas, did not trigger alarms in the upper management strata of Transport Canada is incomprehensible. The two policies, Economic Regulatory Reform and deficit reduction, produced predictable side effects. A substantial escalation in new air carrier certification activity and a greater need for surveillance of existing air carriers created

workload increases of as much as 400 per cent. At the same time, there were insufficient and diminishing numbers of qualified certification inspectors and support staff.

Mr Ian Umbach, superintendent of air carrier operations, large air carriers, in his testimony made reference to the Douglas Report and provided graphic insight into the problems facing air carrier inspectors, as seen at the working level:

Q. And were you making submissions to your superiors saying, look, I need more staff?

A. Yes.

Q. So your numbers were a part of that 1,150 [person-years] requested?

A. Yes.

Q. And what signals were you getting from above, from your superiors?

A. Other than losing a PY [person-year], we were getting no response.

Q. And what were the reasons – what was your understanding?

A. We were downsizing.

THE COMMISSIONER: You were what; you were downsizing –

THE WITNESS: Downsizing.

THE COMMISSIONER: – in staff?

THE WITNESS: Yes, sir.

Q. So in effect, you were asking for more inspectors, but in fact, they were taking inspector positions away from you?

A. Yes.

Q. And what about your workload? Were they reallocating your workload or requesting you to do less work?

A. No.

Q. What was happening?

A. We were doing more with less.

Mr Umbach went on to say:

A. And we were increasing our overtime. We were waiving more PPCs [pilot proficiency checks] than we used to do. We were paying less attention to certain areas than we used to.

I was trying to offload some of our normal surveillance responsibilities. And we, in effect, were trying to do as much as we could with the people we had.

(Transcript, vol. 138, pp. 80–82)

Mr William Slaughter, director of Transport Canada's Flight Standards Branch, when questioned as to the transport minister's commitment that ERR would not adversely affect safety, expressed his view that the minister of transport never at any time retreated from that commitment.

Mr Slaughter, however, acknowledged that at least one level of aviation safety had been compromised:

Q. So the Minister has never backed down from that particular commitment; has he?

A. Not that I am aware of, no, sir.

Q. But isn't it a fact that the evidence we have before this Commission from Mr Umbach, from Mr MacGregor, from the Douglas report and from your own agreement, in general, with those reports that safety has been compromised by economic regulatory reform, that it has stretched your resources to the point where you cannot assure the public that the same level of safety is being maintained as was being maintained before?

A. Yes, sir, we certainly have indicated that we can't maintain the monitoring of the industry that we would intend to in the interests of safety, yes.

(Transcript, vol. 147, p. 88)

30 THE EFFECTS OF DEREGULATION AND DOWNSIZING ON AVIATION SAFETY

“Aviation Safety in a Changing Environment,” May 1986

By May 1986 the warnings generated by the Federal Aviation Administration (FAA) experience with deregulation, combined with the already present effects of Canadian Economic Regulatory Reform (ERR), prompted the Aviation Regulation Directorate to prepare a report, “Aviation Safety in a Changing Environment,” for the department’s senior management. This report, referred to throughout the Inquiry as the Douglas Report, after the principal author Mr Donald Douglas, warned of the impact of ERR on the Canadian air carrier industry. It recommended measures for Transport Canada to take in order to cope with the anticipated increased workload resulting from ERR. It is of significance in this review of the effects of ERR to recall Part Five of my Report wherein I examined in detail the experience of Air Ontario as it positioned itself to meet the challenges and opportunities of a deregulated Canadian air carrier industry. The Douglas Report of May 28, 1986, outlined a number of already occurring and anticipated consequences of ERR, many of which appear prophetic in their application to the Air Ontario scenario:

- Higher rate of formation of new companies;
- Expansion of the number of bases of operation of existing companies, especially in geographic regions outside of their existing field of operations;
- Introduction of new and larger aircraft into existing companies;
- Increased leasing of foreign aircraft;
- Sharing of aircraft between carriers;
- New management personnel for expansion of companies;
- Thinning of existing management;
- Hiring of personnel who may not be fully qualified;
- Rapid expansion into unfamiliar areas of operation;

- Rapid acquisition of new equipment;
- Increased contracting out of services (training, maintenance, etc.);
- Fixed wing carriers following the lead of rotary wing carriers in becoming more migratory.

All of the above make the regulatory task far more complex than it was prior to 1984.

(Exhibit 1057, p. 11)

In addition, in 1985, following certain accident investigations shortly after deregulation in the United States, the FAA undertook a full-scale inspection program that it called the National Air Transportation Inspection Program (NATI). From NATI, the FAA produced the following list, which was included as Annex B in the Douglas Report.

DEFICIENCIES ENCOUNTERED IN 1985
NATIONAL AIR TRANSPORTATION INSPECTION PROGRAM

1) OPERATIONS

- a) Improper weight and balance control procedures and inaccurate or incomplete records and/or computations.
- b) Inaccurate or incomplete flight and duty time records.
- c) Lack of, inaccurate, or incomplete flight and cabin crew training records.
- d) Lack of, inaccurate, or incomplete flight crew qualification and currency records, including medicals.
- e) Non-compliance with approved manual procedures and checklists.
- f) Flight crews not recording maintenance deficiencies in aircraft log books.
- g) Inexperienced, unqualified, over-extended, and/or ineffective management personnel.
- h) Lack of control of carry-on baggage.
- i) Non-compliance with approved training programs.
- j) Use of training programs inappropriate for the aircraft being used or the operation being conducted.

- k) Flight and cabin crews not having required certificates, charts, equipment, and current manuals in their possession.
- l) Lack of current company manuals at stations.
- m) Lack of knowledge and improper application of the intent of the Minimum Equipment List (MEL).

2) AIRWORTHINESS

- a) Personnel not properly trained or authorized to perform Required Inspection Items (RII) procedures.
- b) Improper or lack of performance of RII work.
- c) Lack of or inadequate training programs.
- d) Lack of, inaccurate, or incomplete training records.
- e) Unfamiliarity with company policy, procedures, and maintenance manual requirements.
- f) Continuing analysis and surveillance programs improperly implemented.
- g) Lack of knowledge and improper application of the intent of the Minimum Equipment List (MEL).
- h) Maintenance programs inappropriate or incompatible for the aircraft being used or the operation being conducted.
- i) Inappropriate or absent checklists for maintenance tasks performed or for type of maintenance concept approved for the air carrier.
- j) Incomplete, inaccurate or lack of records of Airworthiness Directive compliance or time control requirements.
- k) Aircraft not properly equipped with required emergency equipment.
- l) Unauthorized or improper modifications and/or repairs.
- m) Inexperienced, unqualified and/or ineffective management personnel.
- n) Open discrepancies after performing major maintenance.

- o) Stations not properly equipped.
- p) Special tools and equipment not available or out of required calibration.

Once again, a number of the items listed in Annex B find direct application in the study of Air Ontario.

The expectations outlined in the Douglas Report proved to be accurate and were realized over the next three years as the Canadian air carrier industry, in response to ERR, underwent a major restructuring. Mr Douglas, in his report, summarized the profound effect of ERR on the Canadian situation as follows:

Economic Regulatory Reform, combined with earlier reform measures and the rebound from the recent economic recession, is having a profound effect on our safety regulation system. These effects are not only in terms of increased workload, with some 80 new air carriers being certified annually, but also in the complexity of the task at hand. Mergers, inter-airline leases, contract maintenance and training are all relatively new phenomena that make the inspectors job more difficult and time consuming. We face these challenges along with the Minister of Transport's public directive that safety will not be compromised by any changes in economic regulation.

(Exhibit 1057, p. 30)

Among the report's 28 recommendations is a call for a detailed review of current resources. The report pointed to the need for increased resources to cope with the demands of the larger and more complex Canadian air carrier industry. The report received wide distribution and was used as a basis for briefing the deputy minister of the day, Mr Ramsey Withers, as well as Commons and Senate committees examining the various implications of ERR.

The Lafleur Memorandum, May 1986

The rapid changes occurring within the air carrier industry had a significant influence on Aviation Regulation personnel, particularly in the Ontario and Quebec regions. On May 22, 1986, some six days prior to the release of the Douglas Report, a comprehensive memorandum produced by R.S. Lafleur, director-general, aviation regulation, to Claude LaFrance, his superior and the assistant deputy minister, aviation group, indicated that the Aviation Regulation Directorate was already in serious difficulty:

I am writing to apprise you of the resource situation in the Aviation Regulation Directorate. As you know, the Directorate carries out the Regulatory Program on the basis of safety standards which require specific numbers of certificates and licences to be issued each year, and specific numbers of inspections and audits to be carried out. Over the past eighteen months, the Minister has made a number of public statements that regulatory reform would not be allowed to compromise safety. In order to ensure that this is the case, the Regulatory Program must be carried out in accordance with the established safety standards. I am concerned that due to resource limitation, particularly as a result of staffing freezes, the Aviation Regulation Directorate is not able to fully carry out the Regulatory Program. For some time now, my managers have brought to my attention increasing curtailment of program activity made inevitable by resource limitations.

(Exhibit 1157, p. 1)

Mr Lafleur pointed to a substantial shortfall in Aviation Regulation Directorate personnel that was being exacerbated by a staffing freeze:

Based on established safety standards, the total requirement of the Directorate is therefore slightly over 1200 person-years. With a current strength of 859, the total shortfall in actual people carrying out the program is 341.

This year, an interim allocation of 909 is being delegated to the Directorate. While this is substantially less than the total requirement of the Directorate, it nevertheless represents an increase over the allocation in previous years. However, with recurring staffing freezes, it has not yet been possible for us to make use of the increase and every time a position becomes vacant, the staffing freeze prevents us from staffing it in a timely fashion. As a result, the Program is losing strength rather than gaining it.

(Exhibit 1157, p. 2)

Given the aviation safety implications contained in Mr Lafleur's memorandum, one would expect it to have been accorded a formal response. I believe it is significant that, despite vigorous investigative efforts on the part of Commission staff, a reply to this forceful and urgent memorandum was not discovered in Transport Canada records, nor could its recipient, Mr LaFrance, while on the witness stand, recall a specific response. The fact that there was no response to the memorandum can only be regarded as a serious omission on the part of senior management in Transport Canada.

Preliminary Review of Aviation Regulation, June 1987

In the months following Mr Lafleur's memorandum, the assistant deputy minister, review (ADMR), conducted a preliminary review of the Aviation Regulation Directorate. A report was not published until June 1987. The objectives of the ADMR preliminary review were:

- to assess the impact of ERR on the Directorate's activities vis-à-vis the American experience with deregulation; and
- to provide a planning base for the upcoming comprehensive audit (1987-88) of the departmental regulatory activities, of which Aviation Regulation comprises an important element.

(Exhibit 1158)

The 1987 report confirmed the fears expressed in the original deregulation impact assessment carried out independently by Ontario Region almost three years earlier. The rate of change within the air carrier industry resulting from the new air policy began in 1985, increased steadily through 1986 and 1987, and peaked in 1988 and 1989. Concerning the explosion of activity in the Canadian aviation industry that began in 1985-86, Mr Withers testified as follows:

- Q. In any event, although the legislation ... was promulgated and became fixed in '88, the activity, the allowance to deregulate in Economic Regulatory Reform, when would that happen and start to affect your department?
- A. Well, the impact started to be felt, to the best of my recollection, in about the '85-'86 time frame, in there, we started to see the emergence of new carriers. We started to see mergers taking place. We started to see what is today for Canadian Airlines International its Canadian Partner system. We had Air Canada's connector system, all of these started to move during that period.

(Transcript, vol. 164, pp. 56-57)

This evidence, indicating that the impact of ERR started to be felt in 1985-86, echoed that given previously by virtually all of the Transport Canada witnesses involved in Aviation Regulation and is confirmed by a large body of Transport Canada internal correspondence provided to the Commission.

If Aviation Regulation was to be in a position to respond to the escalating aviation industry demands upon its regulatory and certification areas, it would have had to take urgent measures to have the required resources and procedures in place in 1985 or 1986 at the latest.

The evidence is clear that this was not done and that the air carrier certification and inspection personnel of the Aviation Regulation Directorate, despite their best efforts, were unable to cope in an effective way with rapidly increasing certification and inspection workloads. When the ADMR Preliminary Review report was published in June 1987, the time for preparation for the onslaught of industry activity had long since passed and the regulators had already been overcome by the events. The executive summary to the report emphasises that this was in fact the case and that the senior management of Transport Canada was, in effect, paralysed by reason of the incompatible policies of ERR and fiscal restraint:

Regulatory Reform of the domestic airline industry was introduced at a time when the department possessed neither sufficient trained resources, the required planning and operational processes nor the necessary enforcement capability required to effectively monitor and foster aviation industry compliance with established safety legislation, regulations and standards. In this respect, the Department has generally paralleled the American experience with deregulation.

The 1984 decision to relax the regulation of the domestic airline industry, combined with an improved economic situation and the expansion of the Aviation Regulation mandate, have all served to amplify problems which have compromised the Directorate's effectiveness in the past. Specifically, the following major areas of concern were noted during the preliminary (1987 ADMR) review:

- a) The shortage of trained, experienced inspection staff and other personnel has seriously impacted on the Directorate's ability to effectively perform its mandated tasks;
- b) The increase in certification workload under ERR, resulting from the need to service new and expanding air carriers, is affecting the Directorate's ability to effectively complete its ongoing inspection program, and thereby assure industry compliance with established legislation, regulations and standards;
- c) The Directorate's current program of monitoring air carriers and related maintenance organizations is inadequate to assess the level of compliance of the commercial aviation industry with established legislation, regulations and standards;
- d) The lack of a sufficiently integrated enforcement program and comprehensive system of administrative fines may negatively impact on the Directorate's ability to foster commercial aviation compliance with safety legislation, regulations and standards;
- e) Concerns regarding the system of actioning departmental responses to CASB findings, combined with the possible legal implications arising from the performance of confidential safety surveys, may also implicate the Department should a serious accident occur. Limitations in the area of aviation occurrence

analysis and the perceived need for a more coordinated regional effort in the performance of safety analysis and promotional tasks, may involve some duplication of effort and could preclude the most effective allocation of limited resources to areas of greatest aviation risk.

The report went on to state:

Meanwhile, a vast array of studies of various organizational issues have been completed or are in progress, addressing other management concerns, not necessarily directly related to regulatory reform.

Despite these initiatives, it would appear reasonable to assume that the Directorate is presently unable to provide senior management with sufficient assurance that the aviation industry is in compliance with existing safety legislation, regulations and standards.

(Exhibit 1145, tab 7)

This was the first sign of recognition within the department's corporate body that the warnings of 1984, 1985, and 1986 had become reality and that Transport Canada's Aviation Regulation Program was in serious trouble. That conclusion, drawn in 1987, certainly was supported by evidence before this Inquiry and, indeed, the situation has further deteriorated since that time.

The Inspection/Monitoring Function

As deficiencies in the operation of the Air Ontario F-28 program and in Air Ontario operations and procedures were revealed during the hearings, questions arose as to why these shortfalls had not been identified by the regulator through its inspection process. The Airworthiness and Flight Standards organizations direct the regulatory function of Transport Canada as it applies to the air carriers, and the actual hands-on monitoring of that sector of the aviation industry is performed by inspectors. Compliance with regulations, orders, and standards pertaining to flight operations is monitored by air carrier inspectors and by cabin safety and dangerous goods inspectors. Similar monitoring pertaining to airworthiness and maintenance is conducted by airworthiness technical inspectors.

The testimony of numerous witnesses revealed that many of the inspection programs were in serious trouble during the time leading up to the Air Ontario F-28 accident at Dryden. There was a high turnover of inspectors and a shortage of qualified applicants for replacement, particularly in the Ontario Region. As a consequence of the explosive demands upon Transport Canada, the training of inspectors was

sporadic, inspector competency became questionable, and workloads associated with the increasing aviation activity were excessive.

Air Carrier Operations Inspection

The duties and responsibilities of air carrier operations inspectors are outlined in the Air Carrier Inspection Manual, which sets out the policies and procedures for monitoring air carrier flight operations conformance with the Air Regulations and Air Navigation Orders. The inspectors monitor air carrier operations by conducting in-flight inspections, check rides, audits, and reviews. They also participate in the approval process associated with company certification, including operations manuals as well as flight and cabin crew training programs.

The allocation of responsibility for the inspection of companies utilizing large aircraft was in the process of change at the time of the introduction of the F-28 aircraft to Air Ontario. This transfer was occurring as a result of increased activity associated with ERR whereby regional carriers that were previously equipped with smaller aircraft were in many instances acquiring large aircraft. As a result, some of the responsibility for inspecting companies equipped with large aircraft was transferred from the headquarters heavy air carrier inspector group to the regions. Mr Donald Sinclair, former Ontario Region manager of air carrier operations, reviewed the changes in the operational structure of commercial air carriers as far back as 1980. He advised that these changes had been brought about by a number of companies acquiring larger and more advanced aircraft. Previously, air carriers such as Air Canada, Wardair, and Canadian Pacific were the only companies operating large jet transport aircraft. As companies like Air Ontario and Bradley First Air acquired aircraft such as the F-28 and the B727, regional inspectors had to have type qualifications to conduct check rides on those aircraft. Mr William Slaughter, director of Transport Canada's Flight Standards Branch, explained in his evidence:

- A. So now we have gotten away from weight of aircraft [as a criterion for assigning inspection responsibility]. In fact, some of the traditional regions have large aircraft. Witness Ontario region has First Air as one of their carriers, and First Air, of course, is flying 727s.

(Transcript, vol. 144, p. 24)

Another change at the organizational level was the formation of the headquarters-based Air Carrier Operations International/National Division (Seventh Region). As Mr Slaughter described it:

- A. Fundamentally, the regions apply the operational standards and do the inspections and the headquarters develop the programs.

The seventh region, or the international organization, although they were located in Ottawa, really had regional responsibilities, because they were applying the standards to the specific carriers that were assigned to them.

(Transcript, vol. 144, pp. 22-23)

The changeover in responsibility between region and headquarters was occurring at a time when the full impact of expansion in activity was being experienced. Implementation of such a jurisdictional changeover presented its own problems. Mr Donald Sinclair indicated that the intent of these changes was to consolidate responsibility for the operators of the large air carrier aircraft within the Seventh Region. The process became unwieldy, however, in dealing with companies that operate several types of aircraft; for example, Bradley First Air operated not only the large B727 and the HS-748, but also the smaller Twin Otters; Air Ontario operated not only the large F-28 and Convair 580, but also the Dash-8 and the smaller Beech 99 aircraft.

The reorganization, although designed to improve the regulatory monitoring capability, experienced some difficulty in its early stages. Mr Donald Sinclair addressed the situation:

- Q. When is the first time, sir, that you heard of this new, if I can call it, the new methodology going towards the seventh region concept? When did that first come to your attention?

- A. It would be some time in the fall of, I believe, 1988. It would have been passed on to me by the regional director, having been discussed at the aviation regulation management board that met four times yearly.

- Q. Mr Sinclair, would it be fair to say that in the years '88, '89, when this evolution was ongoing, that the lines of jurisdiction between regions, headquarters, seventh region were fuzzy, to say the least?

- A. That is a good description.

(Transcript, vol. 142, p. 16)

The regions were also expected to become more directly involved in inspection processes involving more advanced equipment. In order to deal with the large aircraft now in use in the Ontario Region, Mr Donald Sinclair created the Air Carrier Inspection, Large Aeroplanes Division, in his branch in January 1988. Mr Martin Brayman, superintendent of the section, explained his understanding of its establishment:

- A. ... all the existing regional carriers were moving up into bigger equipment. Several new carriers had made applications for

operating certificates. And I believe Don's idea was to develop a shop in the Ontario region, parallel to heavy air carrier in Ottawa, in order to speed up the certification and inspection process so that we could meet the requirement.

- Q. So it was an attempt to meet the perceived and actual expansion of air carrier activity in your region, being Ontario region?
- A. That's true.

(Transcript, vol. 131, p. 9)

In this transitional period, the Ontario Region was faced with the introduction of the F-28 operation into Air Ontario.

Ontario Region, Air Carrier Inspection, Large Aeroplanes Division

Mr Brayman assumed the position of superintendent, air carrier inspection, large aeroplanes, in the Ontario Region in January 1988 and shortly thereafter was assigned two new inspectors. Mr Randy Pitcher joined Transport Canada in mid-February 1988 and Mr William Brooks arrived in March 1988. Mr Brayman described the background of these new inspectors as follows:

- A. Bill Brooks was an extremely qualified captain. He had been flying Dash 8s for quite some time with City Express and because of that background and experience, fitted in very, very well because, as you know – or don't know – at that time, Air Ontario was undergoing a terrific expansion in London and ... our Dash 8 inspector had left the department, and Bill fitted in and took up the slack.
- ... Randy's background was somewhat limited. We needed ... someone to go on the F-28.

(Transcript, vol. 131, pp. 10–11)

Mr Pitcher's flying background included time on the Grumman G2 aircraft and the BAC 1-11, which were somewhat similar to the engine output and weight classification of the F-28.

Mr Brayman explained his plans for these two new inspectors. Mr Pitcher was to proceed on the F-28 course as soon as possible, so he could become lead inspector for the F-28 operation with Air Ontario, a position forecast to commence in the summer of 1988. Mr Brooks was to become the principal company inspector for Air Ontario. Air Ontario at that time was commencing its transition to the Dash-8 aircraft, which would eventually replace the existing Convair 580s.

It is symptomatic of the pressures of the times that plans were being made for these two new inspectors to assume such responsibility within the early months of their employment with Transport Canada. Mr Brayman testified that the time required for an inspector to be fully

qualified in all respects was from two to two-and-a-half years. Similar estimates were provided by Mr Donald Sinclair and other inspectors. One of the contributing factors to this fast-tracking of neophyte inspectors into positions of full responsibility was the difficulty encountered by Transport Canada in keeping experienced inspectors. Mr Brayman addressed that subject as follows:

A. Every time we got a well-qualified inspector, he would either disappear off to the airlines or be snatched up by heavy air carrier in Ottawa. So we went through a lot of inspectors.

Q. So there was competition for some of your well-qualified people?

A. During that period, there was competition everywhere. Industry was competing for more qualified people, we were competing for more qualified people. Ottawa, and I refer to air carrier in Ottawa, they were competing. It was a very difficult time for the whole industry.

(Transcript, vol. 131, pp. 25-26)

Operations Inspector Training

As this Inquiry heard of the rapidity with which new inspectors were assigned to responsible positions, I came to doubt the adequacy of their preparedness to assume such authority. Applicants for inspector positions must have certain qualifications, including pilot licences, instrument ratings, endorsements of proficiency on certain types and classes of aircraft, and, in some cases, instructor ratings. There is, however, no available course of instruction or study external to Transport Canada that provides the special skills, knowledge, and techniques peculiar to and necessary for inspection duties.

On March 11, 1991, Mr Richard Peters, chairman of the Aircraft Operations Group (AOG), submitted a brief to this Commission. The AOG represents the civil aviation inspectors of Transport Canada. Mr Peters was granted observer status to this Inquiry. At appendix G of the brief is a memorandum dated February 28, 1991, from the senior inspector of the Vancouver Air Carrier Operations Branch addressed to the superintendent, Air Carrier Operations (International/National). The memorandum emphasizes the importance of training for air carrier inspectors and the inadequacies of present systems:

8. Among new inspectors and CCPs [company check pilots] the most often heard remark concerns being thrown to the wolves without adequate training. While Transport Canada has a basic inspectors course, it does not have a program other than OJT [on-job-training] to prepare inspectors for the pitfalls inherent in working with the large aircraft segment of the industry. Similarly, while CCPs

receive training of an ICP [instrument check pilot] nature they are not well informed or aware of their legal responsibilities towards the Crown, nor are they formally advised of pitfalls, or of the support which the Crown would provide in event of challenge or legal proceedings resulting from their actions. These things need to be addressed. We believe that a proper instructional program professionally taught would be of benefit and suggest that a full time person could be employed to develop and instruct a program designed to meet the specific needs of inspectors and CCPs operating on large aeroplanes.

9. Since Air Carrier Inspectors sit in judgement of, and make decisions which can seriously effect the livelihood of others it is important that they have and be perceived as having the full right of and qualification for such authority. Nothing could be more counter-productive to a safety inspection program than to have unqualified people making the observations and decisions. It is, therefore, imperative that the training and qualifications of all of our inspectors be of the highest order (both in the field and at headquarters) and that it be perceived as such. Surely, only the very best people with the best training, would be acceptable for advising the Minister regarding the duties assigned to him by the people of Canada.

During the Inquiry, Mr Pitcher, who joined Transport Canada in mid-February 1988, was questioned about his training with Transport Canada:

Q. ... I just want to narrow down this issue of the delegation of authority first.

If you can recall generally when you received your delegation of authority?

A. I don't recall. I believe it likely was the latter part of March 1988 or April. I really don't remember.

Q. So it would have been within a couple of months, perhaps, of your starting in the position?

A. Yes.

Q. At the time that you received your delegation of authority, was there any explanation or briefing given to you as to the significance of the delegation of authority?

A. I believe I was briefed on what not to do. I can certainly tell you that I was not encouraged or sent out into the field to, sort of, you know, wear my black hat, as it were.

(Transcript, vol. 126, pp. 155-56)

Mr Pitcher provided the Inquiry with an air carrier inspector's work diary (Exhibit 982), which included the following significant items:

1988

- April 22 Received authority to conduct instrument rating and renewal check rides on behalf of TC
- May 9-13 Attended audit training course
- May 19 Conducted aircraft inspection on F-28 aircraft at Air Ontario
- July 29 Commenced training on F-28 aircraft with Piedmont Airlines
- October 17 Commenced TC orientation course and enforcement course
- November 7 Conducted first check rides as check pilot on F-28 aircraft

1989

- January 16 Commenced air carrier inspectors specialist course

The points of concern here are that Mr Pitcher had been delegated inspector authority and was conducting flight checks for instrument rating renewals and pilot proficiency checks on candidates within ten weeks of joining Transport Canada. The instrument flight check instruction he received to qualify him for conduct of check rides was done through a monitoring system with the Transport Canada flight operations organization based at Lester B. Pearson International Airport. The training he had received by that time did not include the Transport Canada basic orientation, introduction to enforcement, or the air carrier inspectors training courses. The remainder of the job-related knowledge he acquired prior to performing these functions was obtained through self-study or by accompanying other inspectors on their routine duties. Most importantly, by November 7, 1988, he was conducting check rides on F-28 pilots, was designated the lead inspector for that aircraft, and was therefore the primary Transport Canada authority for Air Ontario regarding operation of their newly acquired F-28s. He did not, however, attend the air carrier inspectors formal training course until January 1989.

Mr Brooks's training was provided in a similar manner. In fact, Mr Brooks, although appointed Air Ontario principal inspector in the spring of 1988, took the orientation and enforcement courses at the same time as Mr Pitcher. Neither inspector received his air carrier inspector specialty training course until January 1989, yet both had been performing inspection functions since early 1988. They were placed in highly responsible positions during that critical transitional period in which Austin Airways was merging with Air Ontario Limited to form Air Ontario Inc.

I doubt very much that the air carriers and the travelling public were adequately served considering the level of knowledge, training, and inspector competence acquired by inspectors under such circumstances.

The aviation industry and the fare-paying customer are entitled to expect that the inspectors representing the regulatory authority are adequately trained and qualified to perform the duties expected of them, and that they are capable of providing sound judgement in the discharge of their responsibilities. In the case of Mr Pitcher and Mr Brooks, however, there was no formal scheduled training and no certification program provided by Transport Canada to assure the competency that should be a prerequisite to the all-important air carrier inspection responsibilities.

Air Carrier Airworthiness Inspection

Mr Ole Nielsen, airworthiness superintendent of air carrier inspection for the Ontario Region, explained in evidence before this Inquiry that while the region is responsible for the direct monitoring of air carrier maintenance programs, there is ongoing contact by the region with headquarters for policy direction and guidance for unusual situations. Principal airworthiness inspectors are assigned to specific air carriers to monitor carrier operations and to ensure compliance with airworthiness standards.

At the time of the introduction of the F-28 aircraft into Air Ontario's operations in June 1988, Mr Nielsen, as principal inspector for that carrier, was directly involved in the formulation and approval of the initial Air Ontario Maintenance Control Manual (Exhibit 319). He had also participated in the initial airworthiness inspection of the F-28 aircraft being leased by Air Ontario from Transport Aérien Transrégional (TAT) in Europe. In early 1988 Mr Nielsen was promoted to his position as superintendent and was succeeded by Mr Wesley Watson as principal airworthiness inspector for Air Ontario. The inspector filling this position is responsible for followup action with respect to deficiencies identified in audits carried out on Air Ontario's operations. Shortly after Mr Watson's appointment, he too was replaced as the principal inspector by Mr Alexander Brytak of the London District Office. This lack of continuity in the position of principal inspector of the Air Ontario F-28 program was not, in my view, conducive to proper monitoring of that critical program by Transport Canada.

In addition to these personnel and organizational changes in the Ontario Region, Mr Nielsen explained that the Airworthiness Branch of the Ontario Region was beginning to suffer from a lack of experienced inspectors. He said that the more senior inspectors were being attracted to positions with industry, which in effect doubled the salary they were offered by Transport Canada. As a result, less experienced inspectors were expected to assume fairly senior positions because there was no one more qualified left to fill their jobs. Mr Nielsen described the inspection situation in 1988:

- A. We were seven or eight, and so we lost three ...

So Mr Watson ended up taking over as sort of the odd man out, because we didn't have anybody else at the time to handle that, because the other inspectors were already charged with their workloads.

(Transcript, vol. 129, p. 74)

Mr Nielsen confirmed that Mr Watson had, at that time, been less than a year with Transport Canada and had not, to Mr Nielsen's recollection, completed his training or received full delegation of authority. He agreed that Mr Watson had been "sort of thrust into this job in June 1988" because the more experienced inspectors were leaving Transport Canada for higher-paying jobs.

Airworthiness Inspector Training

Mr Nielsen's description of the cursory and unstructured training program that was provided by Transport Canada for its airworthiness air carrier inspectors bears similarities to that provided for air carrier operations inspectors:

- A. So the majority of the training for the first year was on the job. I took a five-week course in Oklahoma City. At that time, it was called the air carrier avionics inspector indoctrination course, and it dealt mainly with the Federal Air Regulations and the application of those regulations in the U.S. It had limited application in Canada, but it was certainly of great benefit to me.

And then the next training we had over that first year – or that I had over that first year was an in-house course on flight authorities, and following that course, and the on-the-job training that I had taken for that first year, I was issued delegation of authority at which time I became responsible for Bradley Air Services, and ... my responsibility for Bradley evolved either concurrently with my delegation of authority or slightly before, I just don't recall.

(Transcript, vol. 129, p. 18)

Mr Nielsen, in addition to his qualifications as an airworthiness inspector, was an experienced albeit not current pilot, a training officer, and a supervisor before he joined Transport Canada. Notwithstanding his previous experience, he testified that it was one-and-a-half to two years before he "felt comfortable in making any relevant regulatory decisions" (Transcript, vol. 129, p. 73).

Both the Airworthiness and Operations branches, then, were having difficulty in the deregulated environment obtaining candidates to be trained as inspectors. At the same time, Transport Canada failed to

provide a consolidated and timely training program for its inspector-trainees to enable them to acquire the competency necessary for credible inspection and surveillance of the air carrier industry.

Inspector Training: General

The entire subject of inspector competency and training has been studied on numerous occasions by internal Transport Canada organizations and through external studies. A preliminary review of the Aviation Regulation Directorate was conducted by the Internal Audit Branch in June 1987. With regard to training, its report stated:

Historically, the Aviation Regulation Directorate has lacked a comprehensive internal training program. Progress is being made but currently there exists no national data base to capture training backlogs and to identify who has been trained and who requires what training. Most of the work to date has been performed without the benefit of a formal comprehensive training policy, with the regional managers being primarily responsible for the identification of training requirements. The development of such a training policy is, however, scheduled for completion in December 1987.

(Exhibit 1158, p. 8)

This report clearly documented the Aviation Regulation Directorate's lack of attention and dedication to training, particularly in view of the increasing shortage of experienced inspectors. It pointed out that, as a result, mandated tasks were performed with "a significant number of new, inexperienced staff."

In 1988 a special report was prepared for the director-general, aviation regulation, that was intended to assess the impact of the issues raised by the Internal Audit Branch. Following are excerpts from that document with respect to training:

Although recruitment provides candidates with basic qualifications there is no source-market of fully trained and qualified inspectors. The aviation industry has the right to be assured that inspectors, who will assess its performance, have the necessary skills, knowledge and experience. Failure to provide that assurance leads to reduced credibility, distrust and eventual disdain of the regulatory function. It is imperative therefore that sound training be provided and inspectors be certified as having achieved accepted levels of competency prior to assuming an official inspection role.

...

[Transport Canada should] [d]esign a comprehensive training policy to address the entire training needs of Aviation Regulation from entry-to-retirement. The policy should assure certification and

recertification of competencies throughout careers thereby ensuring technical knowledge and expertise at a level which should be expected by industry and consistent with a clear role statement.

(Exhibit 1313, pp. 10, 14)

In August 1989 the Management Consulting Services Branch of Transport Canada issued the Review of Civil Aviation Inspector/Engineer Technical Training Program, which reiterated many of these recommendations, particularly with regard to basic training:

The initial basic training for all Civil Aviation inspectors/engineers, with the exception of Air Worthiness inspectors, should be provided in a single segment course string consisting of the Introduction to Enforcement Course followed by the Basic Specialty Course. This training should be provided to new inspectors/engineers within the first three to six months of employment.

(p. 39)

The study called attention to the delay in providing a sound training policy for the Transport Canada aviation organization:

A Civil Aviation Inspector/Engineer Technical Training Policy has been in draft form for over two years. This policy endeavours to specifically describe the key mandatory elements of the inspector/engineer technical training program and the role of AARE [Director Inspector/Engineer Training and Development] and the other organizations in support of them.

The policy has never been fully developed to categorically define the technical training program and the associated roles and responsibilities of not only AARE but the other Aviation Group organizations supporting the program. A recent revision to the policy has been proposed for senior management approval. This policy is a basic statement identifying the framework and sequence for technical training courses for inspectors/engineers.

The policy should cover the total technical training lifecycle in terms of structures, process and associated roles and responsibilities, to ensure that all critical elements of an effective training program are clearly enunciated. The policy should also address other areas of inspector/engineer training to ensure the organizational mandate for each aspect of the total program is well understood.

(p. 55)

The subject of inspector training has been studied over a considerable period of time, but with little result. Inspector training that ensures the operating integrity of our nation's air carriers is in my view essential. The time has come for Transport Canada to take positive action to provide clear policy in this vital area and to implement an effective inspector training program.

Delegation of Authority

The minister may delegate authority to approved individuals and agencies, both within and outside the government. A document, known within Transport Canada as "The Delegation Document" (Exhibit 958) dated May 28, 1990, contains 58 schedules, each of which indicates the authorities that may be delegated to the incumbent of a specific Transport Canada position. The document contains a proviso that "This authorization may be limited by superior officers in respect of subordinates who lack the knowledge, experience or training needed to exercise the powers listed in the schedule or who are not required to exercise responsibilities related to such powers." A statement on an individual inspector's identification card indicates which of these schedules of authorities have been so delegated. Inspectors also receive credential cards identifying them as persons authorized to make inspections and inquiries in accordance with the provisions of the Air Regulations.

Delegation may also be made to appropriate segments of industry such as designated flight-test examiners, company check pilots, and approved maintenance organizations. These persons or agencies may be approved to provide services, perform inspections, and conduct check rides, and their authorities are usually provided in the form of written letters of authorization.

These two aspects of delegated authorities were addressed in some detail during the hearings. Points of concern were raised regarding the apparent inability of Transport Canada to provide enough qualified inspectors to perform all of the inspection duties demanded of them. Time and again, when faced with questions why a certain regulatory function, such as an inspection, was not performed or a Transport Canada check ride waived, the responses were that there were insufficient qualified personnel available to meet such demands. Inevitably, questions arose as to alternative methods to provide such surveillance and the possibility of delegating further authority to qualified sectors of the aviation industry. Questions also arose as to the competence of inspectors to perform their delegated functions as well as their availability to conduct such activities.

Delegation of Authority to Inspectors

Transport Canada was experiencing obvious post-deregulation problems in attracting suitable applicants for inspector positions, retaining them, and providing adequate and timely training. Inspectors Brayman, Donald Sinclair, and Nielsen expressed the view that inspectors were not qualified to conduct all of their inspection duties until they had been on the job for anywhere from 18 months to two-and-a-half years. Nevertheless, these witnesses testified that inspectors such as Mr Pitcher and Mr

Brooks were issued credentials authorizing their delegation of authority as trained and competent inspectors prior to completion of their formal training. The training that was planned or proposed for these inspectors seems to have been designed to prepare them, in terms of knowledge of their duties and the regulations, to a level that would support the delegation of authority. However, evidence indicates they were assigned these tasks and responsibilities before they were properly trained to fulfil them.

I have concluded, therefore, that the Transport Canada training policy and program for such inspectors was inadequate and, as a consequence, the organization was not able to assure the competency of inspectors at the time they were issued their delegated authority. In view of these inadequacies, the workload expected and demanded of the Aviation Regulation Directorate exceeded the capability of its workforce. Other means should have been devised to provide surveillance at a level necessary for the assurance of aviation safety. Further delegation of some regulatory functions was one option. *

Delegation of Authority to Industry

Additional delegation of aviation regulation authority to external agencies has been the subject of previous studies conducted by or on behalf of Transport Canada in 1982, 1986, 1987, and 1988. Although each of these studies recommended additional delegation, there is little evidence of any consequent action. The latest study, conducted by Transport Canada's Management Services Branch in 1990, examined the present system of external delegations, alternatives of additional delegations, and their impact on the regulatory programs and its resources. Recommendations were, once again, made for further delegation of certain authorities to persons or agencies external to Transport Canada.

The 1990 Management Services study concluded that a potential exists for delegation in several areas that would yield an annual estimated savings to Transport Canada in the range of 86 to 90 person-years. The study warns, however, that its specific recommendations should form only a basis for discussion and that detailed risk assessment must be made as part of the analysis process. Many of the proposed delegations would require the cooperation of industry and considerable consultation. The report suggests there is potential for additional delegation of the following regulatory functions:

- Expansion of the check pilot program to individuals outside of air carriers (e.g., qualified freelance training organizations);
- Registration of aircraft and approval of markings;
- Development, administration, invigilation of certain functions of personnel licensing;

- Expansion of the airworthiness inspection representatives' (AIR) authorities;
- Expansion of the designated flight test examiner (DFTE) program to include foreign-based IFR flight tests for renewal of Canadian pilot licences; and
- The designated amateur-built inspection program.

(Based on Exhibit 1315, pp. 2-3)

The study also recommends in-depth consideration of the possibility of delegating flight standards and airworthiness audits to third parties.

The study observes there is a need for consensus within Aviation Regulation as to the desired focus of Transport Canada programs for the future. The questions raised by the study include the extent to which the focus should be on service versus regulation; the extent to which service activities contribute towards improved compliance; and what the implications for safety will be.

Mr Weldon Newton, then director-general of aviation regulation, expressed his views on this subject as follows in his testimony:

- A. The delegation document focuses primarily, if not exclusively, on the level of service to the industry. Can we structure our programs that are services to the industry so that they can basically self-serve, get our resources out of these delegated areas and put them into the discretionary areas of monitoring and surveillance and investigation.

In other words, can we extricate ourselves from the service areas and put these into the more hard-core regulatory activities. That is the madness in the method if you will.

- Q. The madness is or the rationale I take it then is if industry can do it, and you can monitor the industry's activity, you can do so with less inspectors and less PYs [person-years]; is that fair?

- A. Well, I can take those PYs and put them into other activities. The activities like audits, surveillance and those types of things. I'll reprofile them. I won't let those people go. If I can delegate an activity and I save 14 PYs, the objective is not downsizing, the objective is to take them out of that activity and put them into these discretionary things like surveillance and vigilance and monitoring of the industry.

- Q. Recognizing that you still have to monitor what you have delegated out?

- A. Correct. That is ... in the model.

(Transcript, vol. 161, pp. 93-94)

In summary, Mr Newton supported the proposal of further delegation of some inspection duties he considered non-critical, thereby allowing more dedication to surveillance and monitoring of safety-sensitive activity.

Mr Slaughter expressed views which, if accepted, would see further delegation of authority to industry. In his opinion, there would not be any further loss in safety assurance, provided there was adequate monitoring. He explained his priorities in a memorandum of October 9, 1990, outlining operational priorities:

More and more the Air Carrier Inspectors will change from active and direct participation in conducting PPCs [pilot proficiency checks] on air carrier pilots to a function of overseeing and monitoring the safety of the air transportation system by ensuring that designated Check Pilots are closely monitored to ensure that they are providing the highest possible standard of operational safety, and by monitoring and evaluating the air carrier operational activities on a continuing basis.

(Exhibit 1119, p. 2)

One section of the AOG brief mentioned above outlines the regulatory functions performed by the air carrier inspectors and their concerns regarding possible further delegation of such inspection authority to the private sector. The brief addresses the conduct of proficiency checks and the conditions under which those checks could be delegated to air carriers. The submission represents the concerns of the civil aviation inspectors at present engaged in such operations and points out the pitfalls of further delegation. Particular emphasis was placed on possible conflict of interest, pressures of an economic nature, lack of proper training courses for company check pilots (CCPs), and the likely pressures of additional duties usually assigned to persons to whom the CCP authority might be delegated. The consensus of this group is that the delegation of CCP authorities to industry has reached its maximum effective and safe limit and that any further delegation would have an adverse effect on the assurance of aviation safety. There is a case to be made for both sides of the argument on further delegation of inspection authority to the private sector.

In September 1988 the deputy minister of transport initiated an Evaluation of Aviation Regulation and Safety Programs. The consultant firms of James F. Hickling and Sypher-Mueller International were engaged to assist with that study. On receipt of their final reports to the deputy minister's committee, the staff of Transport Canada's assistant deputy minister, review, produced a consolidation of those studies that was provided to the Commission. In regard to delegation of authority, that review stated in part:

In view of the shortage of experienced trained inspection staff, it is suggested that much more regulatory activity be delegated to appropriate segments of the industry: for example, initial and

renewal PPCs to Designated Flight Test Examiners (DFTEs); IFR checks (to the extent they are still needed) to DFTEs; greater approval authorities for DARs [design, approval representatives], and Approved Maintenance Organizations (AMOs); more delegation to Company Check Pilots; etc.

(Exhibit 1323, p. 10)

The review recommends “more effective use of resources through delegations and training” (Exhibit 1323, p. 27). It suggests a number of other areas for further delegation, with the proviso that emphasis would then be placed on a Transport Canada role of checking-the-checkers. The document proposes careful selection of agencies to be granted such authority, based on demonstration of a high level of competence over several years. Programs that delegate authority to outside agencies have been in effect for years and have been quite successful. In fact, some of these programs were implemented and delegated to industry.

Witness Views Regarding Delegation of Authority to Industry

In general terms, there seem to be two opinions that evolve from the evidence received. At the working level – the inspectors, lead inspectors, principal inspectors who deal with the air carriers on a regular basis, and those members of the regulatory group involved in enforcement – there is concern about further delegation. Mr Brayman was not averse to further delegation of pilot proficiency check authority to company check pilots, provided the check system assured their competency. Mr Umbach, however, expressed the view that the maximum practicable level of delegation had been reached and that further delegation would degrade the level of safety assurance. The inspectors who testified before this Inquiry in general were of the view that more hands-on participation by Transport Canada inspectors in the ensuring of conformity with regulations is necessary to improve the effectiveness of the regulatory program.

At the more senior levels, which are more directly subjected to pressures to manage better with fewer resources, there is a tendency to favour more delegation to industry. Numerous studies support delegation under responsibly controlled conditions.

It seems certain that economic restraint will limit available resources even for the important Aviation Regulation program. Further delegation seems the only reasonable alternative to a desirable but unattainable increase in resources. I am convinced that such additional delegated activity can be conducted in a satisfactory manner, provided vigilant monitoring of the process is sustained and supported by prompt and firm enforcement action where warranted. Care must be taken, however,

to redirect resultant resource savings to bolster safety assurance programs that require additional resources.

Inspection Performance

Discretionary/Non-Discretionary Tasks

The tasks performed by aviation regulation inspectors are described as being either discretionary or non-discretionary. The classification of these tasks has bearing on the priorities that are allotted to them and the weight factors applied to their value in the formulas used for identification of human resource requirements.

During the testimony of various witnesses from Transport Canada, the use and interpretation of the terms “discretionary” and “non-discretionary” received considerable attention. Witnesses Mr Ronald Armstrong, Ontario Region’s director of aviation regulation, and Mr Weldon Newton, Transport Canada’s director-general of aviation regulation, both described discretionary activities as those such as audits, surveillance, and ramp inspection. Non-discretionary activities were described as those that were required by regulation to allow an air carrier to operate. For example, activities pertaining to the issuance of an operating certificate would be non-discretionary.

Mr Newton explained the implications of this requirement to give priority to non-discretionary tasks versus those classified as discretionary:

- A. So what you tend to do is you will take your resources from the audit, the surveillance and those activities and you put them into the certification activities. You know, as the client is screaming at the door and saying, I want you to certify my carrier, that you will add the necessary resources from – you will basically take them from the discretionary surveillance side and put them into the level of service side to certify that carrier.

It is a short-term solution to serve the industry but on a sustained basis, it becomes a problem because you then are taking your resources and you are reprofiling them into these service areas at the cost of the surveillance of the industry.

(Transcript, vol. 161, p. 95)

This statement succinctly described the dilemma Mr Newton faced as the senior aviation regulator providing direction and stating priorities for his staff. Federal legislation requires that certain standards of certification and licensing be observed by the air carriers. These regulations include applications for and issue of operating certificates, operational specifications, manufacturing and maintenance procedures, pilot licences, instrument rating tests and renewals, and pilot proficiency checks.

Having legislated such requirements, it follows that the Aviation Regulation organization is bound to provide the inspectional and administrative services required by those regulations. Such services must be delivered as a matter of priority. Other inspection functions of surveillance and monitoring of the performance of the industry through audits, ramp inspections, and in-flight inspections, although high in safety assurance value, fall into the category of non-discretionary tasks.

This is the dilemma that the regulator must confront in the allocation of priorities to workloads. The problem is particularly acute when periods of high demand combine with deficit reduction and associated resource limitations.

Inspection/Surveillance Priorities

The value of various forms of air carrier surveillance and inspection became a contentious point during the Inquiry. A memorandum dated October 9, 1990, from Mr William Slaughter, director of flight standards, to the air carrier inspection group outlining operational priorities was introduced as Exhibit 1119. A number of witnesses expressed disagreement with the order of those priorities, which placed air carrier audits ahead of in-flight inspections.

Mr Ian Umbach, superintendent of air carrier operations, offered the opinion that in-flight inspections provide the greatest value in assuring industry compliance with safety-related regulations and practice:

- Q. Now, as an inspector, what is the best way to maintain what I will use as safety assurance? Your knowledge that you have a good feeling for safety assurance?
- A. I feel the best is in-flight inspections, what we call in-flight inspections.

(Transcript, vol. 138, p. 51)

Mr Umbach stated that he and other inspectors on his staff had become increasingly uneasy because of their inability to monitor a broad enough spectrum of the industry. He pointed out the fact that some of the pilot proficiency checks were being waived and that in general the regulator was unable to provide the safety assurance monitoring required during that period. He was emphatic in his support for in-flight inspection, pointing out that it is the most effective means, in his view, of monitoring the entire company. On Mr Slaughter's priority list, however, in-flight inspections ranked number 10 on the list of 12 priorities.

Mr Martin Brayman, another very experienced inspector, commented on the value of in-flight inspections as follows:

- A. A flight check [in-flight inspection] is different. A flight check is carried out by an air carrier inspector, and it not only checks on

the conduct of the flight by the pilots but it checks upon all other aspects of the company operation. And in fact, could almost be classed as a mini-audit en route.

Q. A mini-flight audit?

A. Exactly. But more than just a flight, because you are checking – you are checking their bases and the way they turn airplanes around. You are checking quite a list of areas.

Q. So I take it, then, there's a lot of value in doing a flight check by Transport Canada inspectors?

A. It's probably the primary method of establishing compliance.

(Transcript, vol. 131, pp. 161–62)

Mr Newton stated that there had been a difference of opinion within the aviation regulation program, for as long as he had been director-general, as to the relative merit of in-flight inspections and audits. He said there was no unanimity or solidarity among the inspectors that in-flight monitoring is of high value. Mr Newton's evidence indicated his disagreement with the inspectors who regarded in-flight inspections as an in-depth examination and an excellent method of assessing a company's overall operation:

A. ... I am talking of an inspector that walks in an aircraft, sits in a jump seat for two legs of a flight, okay, and just simply observes crew coordination and walks off at the end of the flight without filling out any test failing anyone, okay.

(Transcript, vol. 161, p. 106)

Mr Newton expressed his preference for audits of air carriers rather than in-flight inspections:

A. ... I tend to favour audits.

Q. Which looks at the system?

A. Which looks at the system. But with audits there's bureaucracy, there's reports, there's controversy, there is a whole process.

An inflight inspection, you get on the aircraft, you get off after two legs, there is very little bureaucracy.

(Transcript, vol. 161, p. 108)

If Mr Newton's perception is correct, then one would be hard pressed to disagree with him. There would be little value in an in-flight inspection conducted in such a manner. However, Mr Newton's concept of how these inspections are conducted is at conflict with the actual inspection process as delineated in the Air Carrier Inspection Manual. Further, Mr Newton's opinion is clearly in conflict with the opinions of technical experts in his directorate. Having heard all of the evidence, and not in any way discounting the value of audits, I am convinced that a

properly executed in-flight inspection provides the best opportunity to view all components of an air carrier's operating system in a day-to-day operation. Mr Brayman described such inspections as "mini audits." Surely, if properly conducted, there can be no better way to monitor a flight operation.

Mr Newton's preference for the accounting precision provided by the inspection and systems examination inherent in audits is understandable. They are, however, resource intensive, and may not provide the most cost-effective method of safety measurement within existing resource constraints. In the case of Air Ontario, the Transport Canada audits clearly did not provide better safety measurement within the limits of existing resource constraints. It appears that the values of audits may be more appreciated by the senior management of Transport Canada, who may use the results to indicate work accomplished. Perhaps that viewpoint is understandable in an atmosphere of continual pressure to demonstrate greater productivity with diminishing resources.

Workload

Mr Donald Sinclair, Ontario Region's air carrier operations manager, explained at considerable length the serious effects resulting from the lack of trained inspectors in his area of responsibility:

Q. Now, with the kind of experience that you have had during the years '87, '88, '89, do you think that aviation regulation could deliver safety assurances with the kind of staffing that was available?

A. Not what we had in the Ontario region, in my particular area, no.

(Transcript, vol. 142, p. 100)

Mr Martin Brayman, superintendent of heavy air carrier inspection in the Ontario Region during the period of transition of Air Ontario, made several references in his testimony to the seriousness with which he viewed the increased workload and shortage of personnel. He explained that there was a continually increasing demand on inspector time and that the lack of experience and the dearth of qualified inspectors seriously affected the ability to monitor the industry. He expressed the opinion that during the expansion period 1987-88, no inspector "kept up with all the areas that he was responsible for" (Transcript, vol. 131, p. 105) and that "telephones in those days were melting down going from morning till night" (Transcript, vol. 131, p. 20).

Mr Ronald Armstrong, Ontario Region's director of aviation regulation, provided a concise description of the background and "explosion

of activity'' affecting the regulatory workload during this period of expansion:

- Q. ... So would you agree that there was a fair amount of expansion, aviation expansion, in '88, '89?
- A. I'd say before that. '88 '89, I think, were just at the end of the expansionary, pretty well at the end of the expansionary period. The big bulk would have been '86 to mid '88, early '89.
- Q. And what was going on in region at that time, your understanding?
- A. Basically, an explosion of activity. The *National Transportation Act* had been amended so the filter that the Canadian Transport Commission used to give the department had been removed.

Previously you needed to prove public need and necessity and go through the challenge process there and then the successful candidate would come over to us for an operating certificate.

Well, that filter was removed, and anybody who wanted to start an air carrier service and could find the funding for it could apply.

So ... that was what was happening. Charter companies came and have subsequently gone. Some even tried to come, Regent comes to mind, and although a lot of activity gets put into it, it never comes to fruition and never is issued the operating certificate and got up and running and that.

So there was a lot of certification activity taking place. New companies coming on stream, changes in equipment of the companies, and a general lessening of the experience level at the regional carrier as ... the pilots tended to get drawn up the hierarchy. Had probably its most dramatic effect on the flying training industry where the senior people there were taken into the regionals.

Coincident loss of experienced inspectors within the region, not necessarily the department as a whole. Changeover in management, new route structures.

- Q. And mergers?
- A. Mergers, failures.
- Q. What sort of workload was this placing upon your region?
- A. A very heavy one. The activities rather dramatically increased in the number of pilot proficiency checks that went on. Air carrier branch would have gone, from '84-'85, from 782 PPC instrument rides to '89-'90, 1,921. Almost threefold increase in PPCs.

Inflight inspections doubled during that period, '84-'85 to '90. The basic number of companies pretty well stayed static. As somebody would come in, somebody else would drop off. So it wasn't per se the number of air carriers, it was the activities that those air carriers were getting up to and then the workload involved with bringing somebody on and somebody dropping off the bottom.

Pretty steady, about 30 new companies – 30 to 40 new companies every year, but 30 to 40, almost, companies failing every year.

Q. And I take it a lot of this activity was occurring right in your region?

A. Yes.

(Transcript, vol. 124, pp. 115–17)

Mr Ian Umbach, superintendent of air carrier operations, large air carriers, described the demands on workload, particularly the similarity of effects in Canada with the introduction of ERR to those experienced in the United States during deregulation:

Q. Now, did this similar circumstance happen in Canada?

A. Indeed it did, yes.

Q. Can you comment on it, what was happening?

A. It presented us with an enormous workload that we had great difficulty coping with. We had to virtually lead each carrier by the hand into the jet transport world, starting with top management right down to the flight crews.

We ended up, in many cases, including me, going 30 days at a stretch without a day off.

(Transcript, vol. 138, p. 29)

And similarly:

Q. Can you describe to us your experience in Canada as a result of ERR and the rapid expansion of the carrier industry?

A. It was – as described here, it was an extremely difficult time for us. We – as I pointed out earlier, it was not uncommon for us to go 30 days at a time without a day off.

We were losing inspectors to new carriers, usually our most experienced and most capable inspectors. Recruitment was extremely difficult.

The atmosphere was one of constant crisis, increase in pressure, incessant and strident demands for our services from industry, from the regions and internally.

...

Q. ... what do you mean by incessant and strident demands?

A. The phone would never stop ringing. Carriers needed approvals immediately for a training program. We had sometimes little or no notice for PPCs. The schedule would change. A new carrier would appear out of nowhere saying, I want to start flying.

The regions were experiencing exactly the same problem we were and they would come to us for help. We had a large number of flight operations manuals that required approval, a large number of training programs that had to be approved, and a large number of MELs that required approval.

Each of those, naturally, to the carrier, was a priority. To the region, it was a priority. And we would get priority on top of priority, and ... I can truthfully say it was probably the worst experience of my professional life. I would never want to go through that again.

(Transcript, vol. 138, pp. 41-42)

Perhaps the best example of the frustration levels reached by the inspection groups because of their inability to meet increasing workload demand was expressed in the memorandum from Mr Neale MacGregor, acting chief, air carrier operations, to the director of flight standards, aviation regulation directorate, January 20, 1989. The memorandum states in part:

Prior to ERR the Section was staffed with 30 Air Carrier Inspectors (ACIs) and it was established that an additional 11 were required to meet workload expected to result from increased certification requirements. Since ERR, the workload has increased by over 400%, the Section has lost 5 PYs [person-years], and presently has 3 vacant positions. Of the 22 ACIs on strength, 3 are new-hires and will not be effective until completion of their 2 year training period. This leaves 19 ACIs, including Supervisor staff from an original strength of 30, and a required strength of 41.

As a consequence, we have virtually ceased all monitoring and surveillance of the industry to concentrate exclusively on initial type ratings, captain upgrades, CCP monitors, and certification of new carriers.

The strain on the ACIs is illustrated by accumulated overtime and it is not uncommon to work 30 days without a break. This pace cannot be sustained. To illustrate this point, the Section's overtime budget for FY [fiscal year] 88/89 was \$85,000. In December 1988, authority was received for an additional \$100,000 merely to cover overtime for the remainder of this fiscal year. The overtime equates to 8 PYs, and the problem will become more acute as ACI burnout takes its toll. One Regional ACI is now on extended sick leave (3 months) to recover from overwork, and a Headquarters ACI is also on sick leave due to stress.

(Exhibit 1106, pp. 1-2)

In summarizing the overall situation, Mr MacGregor's memorandum continued:

As one can see, Air Carrier Inspection is no longer capable of meeting even minimum requirements necessary to ensure safety. In fact, it is no longer able to assure the Minister of the safety of large air carrier commercial air services in Canada.

(Exhibit 1106, p. 5)

Seven weeks before the Dryden crash Mr MacGregor warned in the same memorandum that the situation had reached the point where “every ACI [air carrier inspector] and an increasing number of industry pilots are convinced that a major accident is inevitable in this country.” He called for an urgent application of resources to correct a rapidly deteriorating situation:

It should also be noted that Air Carrier Inspection is in a similar situation to the ATS crisis currently in media focus at L.B. Pearson International. The situation is to the point where every ACI and an increasing number of industry pilots are convinced that a major accident is inevitable in this country. The trends towards such an occurrence are no doubt irreversible, but the urgent allocation of additional resources to Air Carrier Inspection would at least be the first step in correcting a rapidly deteriorating situation.

It is our contention that any plan to proceed with the National Audit Program should take the foregoing into consideration.

(Exhibit 1106, p. 5)

The reaction to Mr MacGregor’s memorandum within Transport Canada, particularly at the senior management levels, was no doubt stimulated by the fact that the memo was leaked to the media. Subsequent internal correspondence within the department tended to discredit the concerns expressed by Mr MacGregor as inflammatory in nature. In that respect, I must say that I have heard evidence regarding rushed introduction of aircraft into service, rushed training without adequate flight simulator access, lack of available spare parts, inadequate flight manuals and amendment services, and inexperienced personnel. These factors, when considered against the existence of a regulatory agency that by its own admission was incapable of assuring senior management that carriers were operating in compliance with regulatory safety standards, lead me to believe that Mr MacGregor’s actions were justified, and, indeed, I commend him for his courage.

Clerical Support Staff

A number of Transport Canada witnesses before this Inquiry complained of the apparent lack of understanding at senior levels in Transport Canada of the importance of providing adequate clerical support staff. As a consequence, frequently when staff reductions or staffing freezes are imposed, the support positions are the first to be affected. Situations were described whereby staffing levels did not allow adequate support staff and, consequently, the inspectors ended up doing clerical work at the sacrifice of their regulatory and inspection duties.

Mr Donald Sinclair explained this situation at some length during his testimony. He pointed out that, particularly during staffing freezes, he would on occasion have one clerk to meet the clerical requirements of a staff of about 28 (Transcript, vol. 142, p. 105). In such circumstances, when temporary staff were allowed to fill the position, their lack of knowledge of the administrative process further complicated the situation. His office was responsible for mandatory certification work, including approvals of MELs, flight operations manuals, and recommendations for check pilot authorities, in addition to the inspection/surveillance duties expected of the branch.

This situation was addressed by a series of documents from the Ontario Region (Exhibits 1142, 1143, and 1144). These documents were passed to the assistant deputy minister, aviation, in June 1986. One of these documents, a memorandum from the regional director of aviation regulations, described the situation as "completely intolerable," and added:

Those problems are not simply a lack of staff but include additional workloads imposed by the freeze; compilation of forms, preparation of statements of justification; attempts to interpret circulars, letters, messages, phone calls and discussions on implementation of the restrictions; proceeding with staffing actions, cancelling those actions, re-activating the actions; attempting to overcome critical support staff shortages with a parade of untrained temporary support staff, students and persons from special consideration groups; waste of effort of highly capable clerical staff in training short term help; and finally, serious diversion of the efforts of Managers and supervisors away from their operational and management duties to deal with crises attributable to staffing-freeze-related problems.

(Exhibit 1143)

Based on the evidence I have heard, I find that the conduct of necessary administrative tasks by the inspectors caused a reduction in their ability to discharge their surveillance responsibilities. I view this as particularly critical at a time of obvious increased activity in the aviation industry.

Staffing Problems, Ontario Region: Toronto Area

Ontario Region was more directly affected by regulatory reform than others. Toronto was the centre of the activity associated with expansion in the industry and the base for many new companies entering the business. This situation placed excessive demands on the region's Airworthi-

ness and Air Carrier branches. The staff were subjected to overwork, stressful conditions, and remuneration that did not match the soaring living costs of the area or bear reasonable comparison to private industry. The qualifications and experience of this group were desired by industry, and the inspectors became targets of air carriers' recruiting programs. Mr Ole Nielsen, airworthiness superintendent of air carrier inspection, indicated in his testimony that two of his senior inspector colleagues were enticed into accepting positions with startup airlines offering remuneration half again or double their salaries as senior airworthiness technical inspectors. Similar situations were occurring with pilots and air carrier inspectors.

This increasing demand for talent affected the recruiting programs for the Toronto offices in particular. Mr Armstrong, in his testimony, indicated the difficulty faced in attracting qualified pilots into civil aviation inspector positions, primarily because of the high cost of living in the Toronto area. Mr Sinclair gave similar evidence regarding civil aviation inspectors and Mr Nielsen confirmed that such constraints also applied to airworthiness technical inspectorate candidates. It was shown, by way of example, that it was practically impossible to attract candidates for heavy air carrier inspector positions of the Seventh Region Toronto office. In normal times those positions were considered quite attractive in that they offered upgrading of inspectors to high-performance aircraft of the B747, L1011, or the new B767 classification.

Public service pay rates are based on a classification system without location consideration; thus an inspector or clerk in Toronto receives the same rate of pay as those in similar positions in Moncton or Winnipeg. In such circumstances, recruitment in and for Toronto-based positions was unable to compete with the high wages of the private sector necessary to meet spiralling living costs.

Findings

- Based on the information before this Commission, the Aviation Regulation Directorate was not adequately prepared to perform its functions in the latter 1980s.
- The warning flags raised early in the 1980s and repeatedly thereafter had seemingly negligible effect. The forecasts of safety assurance deficiencies were soundly based and progressively confirmed, yet there was no proper response by the senior management of Transport Canada in the form of urgent planning or action to meet the inevitable challenge.

- It was known that significant increases in personnel would be required to meet demand, yet such increases were not authorized, let alone acquired.
 - Inadequate training policy and supporting programs failed to ensure inspector competency and placed new inspectors in positions of responsibility for which they were not qualified.
 - Forecasts of inspector workloads predicted that the directorate would be overwhelmed, yet there is little evidence of effort to manage the crisis either through further delegation of tasks, contracting out or withdrawal of non-critical services, or other innovative programs to reduce resource requirements. Such lack of planning, preparation, and managerial direction placed junior managers and staff in the position of being unable to perform adequately all of their duties.
 - Had the Transport Canada Aviation Regulation Directorate been in a position to discharge all of its responsibilities in an effective and timely manner, some of the factors that contributed to the Dryden accident may not have arisen.
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RECOMMENDATIONS

It is recommended:

- | | |
|---------|---|
| MCR 110 | That the Aviation Regulation Directorate focus adequate resources on surveillance and monitoring of the air carrier industry, with emphasis on in-flight inspections and unannounced spot checks. |
| MCR 111 | That Transport Canada establish a policy that identifies surveillance of existing air carriers as a non-discretionary task. |
| MCR 112 | That Transport Canada establish a contingency policy in order to meet unusual resource demands without jeopardizing adequate staffing of inspection and surveillance functions. |

- MCR 113** That Transport Canada pursue extension of the delegation of authority to industry in accordance with the recommendations of Transport Canada's Management Consultant Branch studies completed in 1990 on this subject. Where additional delegation of authority to industry can be achieved safely, such delegation should be authorized in order to allow more effective use of Transport Canada inspectors.
- MCR 114** That Transport Canada establish a policy to ensure that required support staff will be provided so that inspector staff will not be misdirected from their operational safety-oriented surveillance duties in order to perform tasks more appropriately conducted by support staff.
- MCR 115** That Transport Canada establish an air carrier inspector training policy to be put into force without further delay, and that the policy ensure the following:
- (a) A clear statement of the requisite competencies for each inspector position in the Airworthiness and Flight Standards directorates of Transport Canada.
 - (b) A statement of the training courses required to be completed successfully by inspectors before they are delegated authority and before their probationary periods end.
 - (c) Successful completion of training to be required before air carrier inspectors are delegated their authority credentials.
 - (d) Establishment of a recurrent training program for each discipline of inspection to ensure continued competence.
- MCR 116** That Transport Canada improve staffing and recruiting programs to enable aviation regulation requirements to be filled on a high-priority basis. The capability to fast-track such staffing requirements should be achieved as soon as reasonably possible.
- MCR 117** That Transport Canada, in consultation with the air carriers, work out an arrangement to accommodate the requirement of no-notice in-flight cabin safety inspections and surveillance on charter flights.

AVIATION REGULATION: RESOURCING PROCESS

Operational Plans

Each year branch managers in Transport Canada regional offices and in the Ottawa headquarters initiate the operational planning process by identifying their resource requirements for future years. The process is long and convoluted, with resource submissions passing through numerous examinations including seven or more individual challenge processes. Mr Ronald Armstrong, Ontario Region's director of aviation regulation, described the process in the course of his evidence:

- A. The process goes, the instructions come down on how to prepare it and they may or may not change from year to year, how we prepare our operational plan that's eventually going to get wrapped up into the department's plan and submitted on to Treasury Board.

The branch managers work with their staff, they develop their plans, they come to me, I perform a challenge process on them, do you really need this, do you really need that, can you put it in a different way, and then they are sent from my office to my manager, Weldon Newton, who then puts them into his resource management unit.

At that point they're taken apart, the submission, and it's sent down to the functional directors, the director of flight standards, the director of airworthiness, the director of enforcement and legislation, and then they look at each of the regional submissions for the areas for which they are responsible, and they do the same thing. They question, they ask, they probe, they augment, they eliminate, as they see it, from a national perspective looking at all of the regions.

They then put their submissions, their national submissions for their program back to the director general who performs the same function, and then it goes to ... our Assistant Deputy Minister who will send our resource allocation to Mr Mousseau's organization, the director general, policy planning and human resource management, who will do exactly the same thing, and in turn, then, the Assistant Deputy Minister provides it to the program control board, again for their vetting, criticism, whatever.

It's modified back and forth, and then whatever's accepted at the departmental level and the program control board would be, in essence, the Deputy Minister sends it to Treasury Board whereupon they do their same evaluation, and then from that comes back the resources to the Deputy Minister, and then it's up to him to decide how many he's giving out to each of the units within his organization, and then all the way down the line. The resources are given to a manager and then they are allocated out.

(Transcript, vol. 125, pp. 25–26)

The description of the resource identification and allocation process provided by Mr Armstrong outlines the numerous managerial levels of review and the complex system of challenges to which the resource requirement requests of branch managers are subjected. Figure 31-1 shows the convoluted system whereby the resource requests are subject to a minimum of eight review levels, and can be sent back to previous levels for whatever reason. The process is discussed in more detail further in this chapter.

For line managers beset with their day-to-day operational commitments, the time involved in such a process, when combined with the time required to staff and train inspectors and to carry out staffing actions for vacant positions, precluded any meaningful response to demand-driven work assignments in real time. Evidence from a number of witnesses indicates that from the time an additional person-year is approved until a person is actually on the job can take in excess of two years. By the time a person is hired, trained, and qualified, the demand may well have come and gone. Mr Armstrong explained:

Q. So you're talking from the time you make your request, it takes a year before the request has been approved?

A. Yeah, we generally – well maybe six to eight months, because generally we start the new fiscal year and our years run April 1 to March 31st, so you'll hear us talking '86/'87 and it would be March 1st, '86, April 30th of '87.

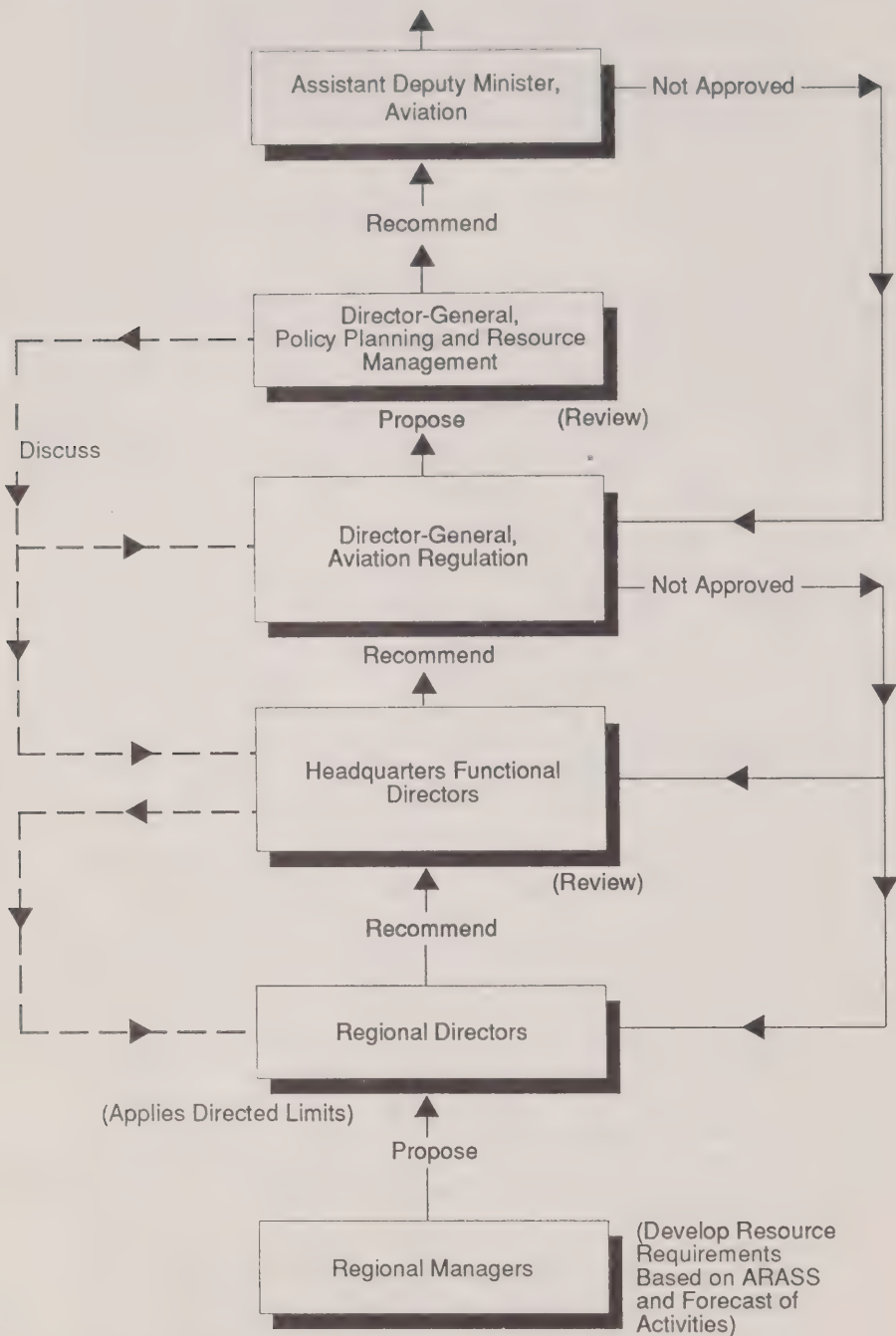
We generally get our allocation of how many person-years we're going to have well after the start of the fiscal year. Hopefully by the end of the first quarter, but about six months.

Q. So, by my calculation, it takes two to three years from the time that you need the resource until you have somebody in your hands you can let loose to be an airworthiness inspector or an air carrier inspector?

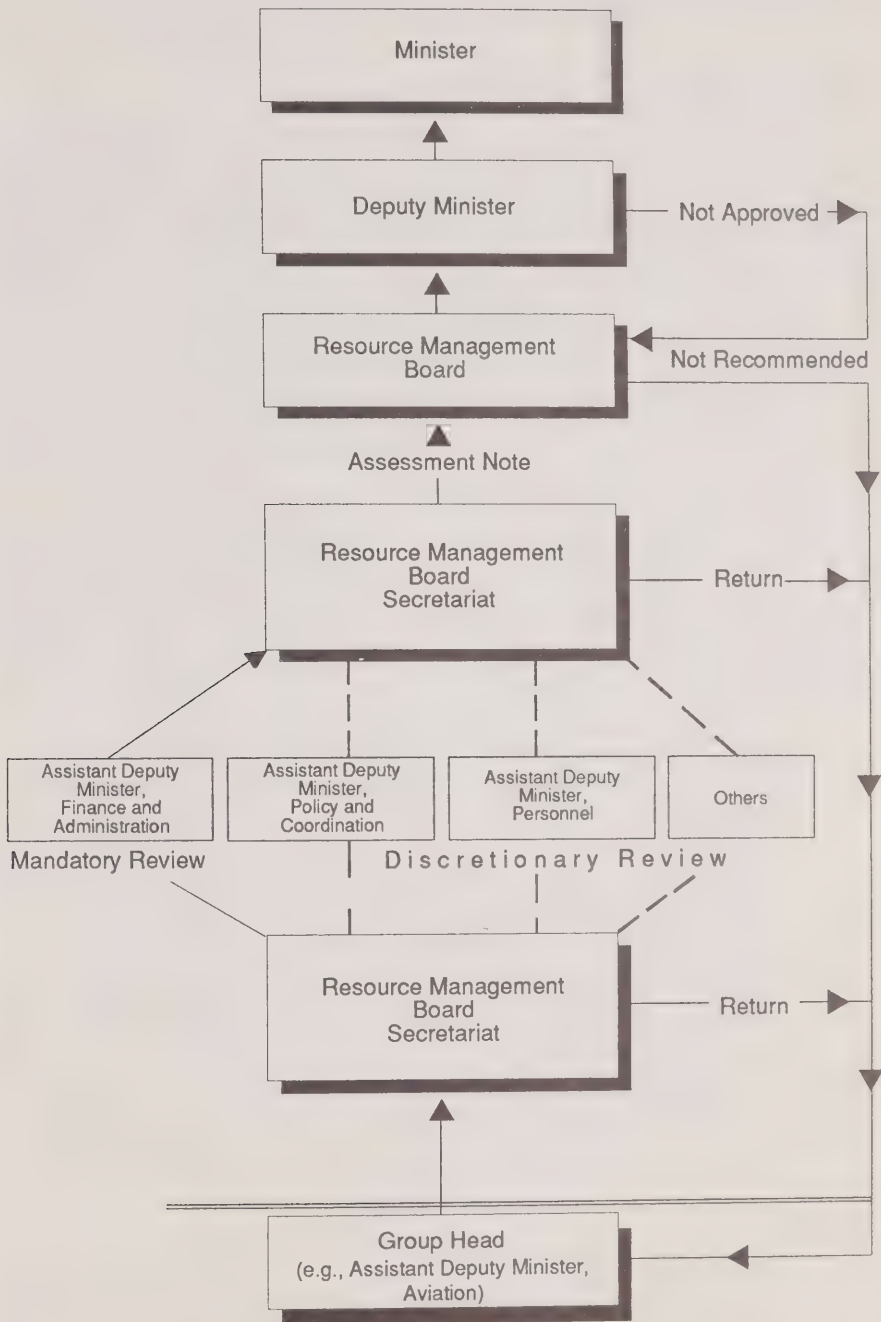
A. We would have them doing work prior to that time, yes, but completely finished all of their formalized training and experienced that they can conduct the whole gamut of responsibilities that they could be tasked with, yeah, that's a fair estimate.

(Transcript, vol. 125, pp. 46–47)

Figure 31-1 The Resourcing Request and Approval Process



Source: From Exhibits 1285 and 1286



This evidence graphically demonstrates the need for a system within the Aviation Group to fast-track additional qualified personnel into critical areas involving safety, when required.

Program Control Board

The origins and role of the Program Control Board (PCB) have been described by Mr Ramsey Withers (see chapter 29, Economic Deregulation and Deficit Reduction). The final challenge to a resource submission from within the department is carried out by the PCB or, as it is now called, the Resource Management Board (RMB). A key component of the Program Control Board is its secretariat, a staff support group of program analysts. The secretariat reviews resource submissions and provides assessment notes to the board to assist in its deliberations. There is apparently no requirement for program analysts with the secretariat to have expertise in the specific areas in which they are assessing resource requests. In my view, this is a serious weakness in the system. I am persuaded by the evidence that the lack of operational aviation expertise within the PCB secretariat contributed to the failure by Transport Canada management to recognize the aviation safety implications that would be caused by the shortage of air carrier inspector resources after 1985. Mr Kenneth Sinclair, assistant deputy minister, policy and coordination, described the role of the secretariat as follows:

Q. [A]nd if a case has been made on paper by Mr [David] Wightman [Transport Canada's assistant deputy minister of aviation] that I need A, B, C, and D to deliver the program that I am responsible for, what steps does the secretariat take in order to review, assess, challenge this document which is put forward by a group head which represents, as we have heard from Mr [Claude] LaFrance [former assistant deputy minister, aviation], the bottom line from their perspective?

A. Well, the analysts, again, as I say, would speak to the Director General or the Director level to obtain that necessary information. If there is a disagreement, they will either ... reach agreement on it through their discussions, or if they ask for additional information. In some cases that is obtained by speaking to experts outside the department, having a consultant look at things and submit a report. Quite often the consultant would be hired by the group to do the work to submit that to the secretariat.

If, at the end of the day they have not reached a consensus on it, then the differing view is put forward, both views are put forward. The secretariat does not, in any way, put forward a filtered or one-sided case, they put forward the case of the

group and their comments on it, along with the recommendations which are then submitted to the Program Control Board for the board to review independently of the working of the secretariat.

(Transcript, vol. 165, p. 24)

While the principles upon which the PCB mandate is based may have merit, the evidence of assistant deputy ministers for Aviation Group and the decision records of board meetings are less reassuring. Mr LaFrance, a witness before this Inquiry, held the position of assistant deputy minister, aviation, from October 1985 to March 1989. According to Mr LaFrance, he ran his own challenge on resource submissions put forth by his managers. When asked to explain the role he played when requests for resources were put forth by his managers, he stated that he personally challenged the resource requests of his directors and he was unequivocal that all of his resource requests submitted to the PCB were absolutely minimum requirements:

- A. Yes. It was very important to get the resources that I needed. It was very important that I had full professional credibility at Program Control Board. And to do that, I challenged the resource requests that I got from my Directors General very strongly on technical operational terms on Aviation, professional Aviation terms.

There was a very strong challenge and I was quite satisfied that in all my requests to PCB I was coming with requests that were, number one, fully justified in Aviation terms; and secondly, that they were the absolute minimum. I was being very frugal.

(Transcript, vol. 163, p. 21)

On the subject of the difficulty of obtaining the necessary resources to fulfil his mandate of assuring aviation safety, Mr LaFrance testified that almost without exception his resource requests were not granted by the PCB. His evidence highlighted another example of the methods employed by senior Transport Canada management in order to circumvent and avoid the allocation of resources in areas impacting on aviation safety. Such methods used by the PCB were simply to require "further justification" for the resource request. The effect was to deny the resources for the year of the request. Mr LaFrance stated:

- Q. ... Did you have difficulty obtaining resources, the resources in terms of person-years and in terms of budget? Did you have difficulty in obtaining ... the amount that you wanted over the years that you were ADMA?

- A. Yes, absolutely. The paper trail shows that my requests were, most of the time, not granted. There were very few instances I believe where it was an outright turndown.

It was more normal to just send me back to the drawing board and say, we need further justification. But if I'm sent back to provide further justification again and again for a period of a year, the net result is a denial of the resources for that year.

- Q. And when you say you were sent back, I take it that you were sent back by Program Control Board?

- A. That is right, yes.

(Transcript, vol. 163, p. 47)

The rejection or referral-back for additional justification to which Mr LaFrance refers occurred at other subordinate challenge levels, not just at PCB. The flow charts at figure 31-1 display the review and challenge process that could involve up to ten levels of management. Sending the resource requests back for further justification could become a delaying tactic precluding fast-tracking and effectively denying the requested increases. The process was extremely cumbersome and debilitating.

Mr LaFrance was sufficiently concerned about the resource situation within his organization to advocate that a memorandum to cabinet be prepared to warn about the potential safety impact of the cuts in personnel and dollars. He is quoted in the PCB minutes of August 17, 1987, as follows:

ADMA [LaFrance] opened his remarks by noting that he wished to address those issues or areas of difference he had with the PCB Assessment Note entitled "Operational Plan - Aviation" dated August 17, 1987. Annex C ...

ADMA pointed out that, with respect to the impact of the deficit reduction program, he felt it was important for Cabinet to be aware of the impact of the cuts, particularly as they may affect flight safety. He further expressed the feeling that safety programs across the Department likely would have similar impacts, and suggested that an overall strategy should be developed on an approach to Cabinet.

(Exhibit 1326, tab 10, pp. 7-8)

It was subsequently confirmed in evidence by Mr Kenneth Sinclair, chairman of the PCB, that no action was taken by the PCB to present to cabinet the concerns of the Aviation Group with respect to the impact of the deficit reduction program on aviation safety programs. Instead, a Treasury Board submission covering the merged resource needs of all four transportation modes within Transport Canada was developed and forwarded to the Treasury Board for approval. Mr Sinclair testified as follows:

Q. Are you aware, sir, whether a submission, in fact, did find its way to Cabinet on safety matters?

A. This will require a short explanation.

Q. Certainly, please.

A. A memorandum to Cabinet is a document that goes to Cabinet. Cabinet is not a committee that allocates resources, it is a committee of Cabinet called the Treasury Board that allocates resources.

So, in the process of developing a memorandum to Cabinet, we realized what we really were doing was preparing a request for additional resources under the heading of ERR which we were entitled to do under the M.O.U., so, the MC became an omnibus Treasury Board submission encompassing the ERR requirements of Transport Canada in all of the modes, not just in the Aviation mode.

Q. So, it became a global submission to Treasury Board on the issue of resource allocation?

A. Affecting a – as a result of ERR. And that document did go forward to the Treasury Board.

Q. All right. Do you recall what happened with that submission to Treasury Board, sir?

A. Yes, they responded to it. They did not give us all the resources that we had requested.

(Transcript, vol. 165, p. 77)

Mr David Wightman, Mr LaFrance's successor as assistant deputy minister, aviation, fared no better in his efforts to obtain resources. When questioned on the witness stand as to the PCB secretariat's assessment of his 1990 operational plan, Mr Wightman gave the surprising evidence that approximately 70 per cent of the Aviation Group's resource submission to the PCB for 1990 was not recommended for funding by the analysts:

A. And we reached the point where we submitted our operational plan and then ... there was a period of at least a week, usually more than that, where the analysts of the Program Control Board do their business on our submission. And they then produce what is called the PCB assessment note in which they discuss each of the items that we have submitted.

And I receive that assessment note before the meeting is called to consider it, and all of the other members of the Program Control Board also receive the assessment note.

I was disappointed with the assessment note because it was clear to me, I'm just quoting numbers here off the top of my head, but approximately 70 per cent of our submission was not funded – was not recommended for funding.

Q. Seventy?

- A. Seven zero per cent of the additional resources that we were asking for over-target, including PYs [person-years] and dollars, operations and maintenance dollars, were not recommended for funding. And so, at the meeting of August 27th, I objected strongly to the conclusions of the secretariat and I also said that I thought that the process was flawed for the reasons that I have already mentioned; that it invites an open-ended submission when it's clear that most of it is not going to be able to be funded.

(Transcript, vol. 166, pp. 56-57)

This phase of the hearings unmasked a deep-rooted sense of frustration among all levels of personnel in the Aviation Group, the vast majority of whom are unquestionably dedicated public servants, over the annual budgetary process. This sense of frustration was well founded.

The time has clearly come for the government to put an end to the cumbersome and costly resource challenge process required by Transport Canada, and to put in place a less cumbersome and more realistic process for assessing aviation resource requests. It is unrealistic to require the already undermanned Aviation Group to participate in an excessively time-consuming process, ostensibly designed to identify and to justify resource requirements, through a multitude of challenges, only to have the PCB analysts then arbitrarily reject as much as 70 per cent of what has been identified as the absolute minimum resource level necessary to maintain an acceptable level of aviation safety.

The upper management of the Aviation Group has shown itself to have been either unwilling or unable to persuade those public servants in charge of final resource allocation of the merits of their aviation safety-related resource requests. At the same time, the evidence leaves little doubt that the PCB, preoccupied as it was with the resource restrictions imposed upon it by the government, was insensitive to the aviation safety concerns that were brought to its attention for resourcing.

Program Needs versus Program Affordability

Mr Wightman referred to a process of identifying person-year requirements, based on a staffing formula that originated in 1984 before deficit reduction was implemented. The subsequent formula, referred to as Aviation Regulation Activity Standards System (ARASS), had been refined over a three- to four-year period. It is essentially a work-tracking mechanism based on a formula of recognized tasks, task frequencies, and completion times that identified existing and anticipated inspector and

support staff requirements to meet the needs of the Aviation Regulation Program.

The root source of Mr Wightman's disappointment in having his operational plan cut by 70 per cent is to be found in the different basis of assessment of resource needs used by his staff and that used by the PCB secretariat. Mr Kenneth Sinclair addressed the issue as follows:

Q. It seems to me from a lay point of view that if Mr Wightman prepares a document using the same benchmarks, the same criteria, the same accepted standard, that your body, PCB uses, and comes to you and gives you a document and says, Mr Sinclair, we've done our homework. We've used the same criteria that you use. We've come up with this bottom line, why do you then have to go through this elaborate reassessment and re-inventing the wheel of what is then before you at that point in time. Could you help us with that?

A. Yes. I will try ... the resourcing model that is used is based on subjective material. It is ... forecasting a future need for resources, it is not dealing with a historical requirement of a demonstrated workload. So, there are some assumptions made before you put together the model which would tell you the resourcing requirements. That is one area that you look into, are the forecasts that are used to then predict the resource requirements, are they valid, that has to be looked at and considered.

And then whatever figure comes out of it, the submission would then – we would then have to deal with what resources are available to allocate to it, the affordability issue.

(Transcript, vol. 165, pp. 38–39)

The fact of the matter is that the entire assessment process before the PCB is little more than a pretence. The absence of a national resource approval process is a key issue. Mr Wightman summed up his view as follows:

A. The trouble is that the thing begins to break down when you know perfectly well that when the man who is responsible for analyzing all of these inputs, starts adding it all up and he finds that the ... total is so large that there is not any remote chance that those resources are going to be made available. So then what do you do about it?

(Transcript, vol. 166, p. 49)

In other words, regardless of the legislative and regulatory requirements and the workload entailed in meeting those requirements, based on a standard developed and approved within the department, it ultimately comes down to what is affordable in the minds of a corporate

body that has little, if any, background or expertise and no accountability pertaining to aviation safety regulation.

The individuals making decisions on resource allocation at the PCB were, on the basis of the evidence before the Commission, basing their decisions primarily on affordability. The evidence indicates that these individuals had little, if any, background knowledge with respect to the minister's obligations under the *Aeronautics Act* to enable them to understand the necessity of delivering a program that ensured that air carriers were in compliance with safety standards. Nor is there any indication that they have any accountability with respect to ensuring the accomplishment of these safety requirements. I am left with the distinct impression from the evidence that the PCB and the senior managers at and above the ADM level failed to recognize that programs such as aviation regulation are not discretionary but are in fact mandatory under the laws of Canada. As Mr LaFrance indicated in testimony before this Commission: "You are not inspecting because a carrier wants to be inspected. This is a need of the government. The government has to budget" (Transcript, vol. 163, p. 85).

I concur with Mr Wightman's assessment of the futility of the present system of resolving the conflict between program needs and affordability, and with his proposal for improvement:

- A. The difficulty I have with the process is that it starts with what, essentially, is an open-ended invitation to all of the Transport Canada managers to submit their requirements. And ... this raises tremendous expectations on the part of managers. It also generates an immense amount of work. Paper is ... just generated over and over again and in huge quantities. Paper which does not have a hope of ever succeeding in what it's trying to do.

So ... my contention in my proposal to the RMB when we do finally get around to discussing the process, as Mr Sinclair said we will do, will be that we need to establish a framework at the beginning of this process. We need to ... make a corporate decision and I will propose that this decision be made by the DM within the TMX committee which is the Transport Management Executive committee consisting of ADMs and the DM.

And I think at that stage a strategy has to be developed, that this year we are going to go forward to Treasury Board for an increase in the overall Transport Canada budget of "X" per cent or whatever it might be. So that when that is decided at the highest level in Transport Canada, then we can give each of the ADMs a target, and we can tell them, now, develop your documentation, develop your operational plan based on this target. And do all the paper work that's necessary for that, but

don't waste your time on the paper work of anything beyond that target.

And then you've got to look at what you've got in this Operational Plan, and if there are clear safety requirements that remain unfunded after that process has been done, then you've got to do what we were hedging around about yesterday and with Mr LaFrance, you've got to state the case clearly to the Deputy Minister.

(Transcript, vol. 166, pp. 51–53)

It is reassuring to have the current assistant deputy minister, aviation, make such an unequivocal statement with respect to his responsibility to go to the deputy minister with respect to unfunded safety requirements. The PCB chairman, Mr Kenneth Sinclair, was asked what right of appeal a group head (ADM) might have should he or she disagree with the PCB recommendation, with respect to the allocation of resources, to the various groups within the department. This was, obviously, an area of considerable interest in light of the apparent conflict between the need, on the one hand, to satisfy the requirement that the industry was in compliance with safety standards and, on the other, to live within the resource levels imposed as a result of budgetary restraint. His response was that it was clearly understood that the practice was for an assistant deputy minister who was not satisfied with the PCB resource recommendation to go to the deputy minister to express concerns, particularly those related to safety:

- A. The Program Control Board is a staff organization serving the Deputy Minister. It is not part of the line accountability regime in any way.

It's clearly understood by all of the Assistant Deputy Ministers and the members of the executive committee that each group head, each ADM, is totally responsible and accountable to the Deputy for the conduct of the program and the mandate of the program for which they are, indeed, the ADM.

The deliberations of the board are done on a consensus discussion basis, and a consensus is reached normally reflecting the general agreement of the members of the board and ... that is what is recorded in the minutes.

If any ADM ... does not agree or is troubled by the decision, then it was clearly understood practice that as the accountable ADM, they would go, and they have the right to go and, indeed, are expected to go to the Deputy to express their concerns, particularly, as related to safety.

(Transcript, vol. 165, pp. 11–12)

I fully endorse the views expressed by Mr Sinclair and Mr Wightman as to the obligation of an assistant deputy minister to go to the deputy

minister in situations where the safety obligations imposed on the government by federal statutes go unattended because of financial considerations. I would go one step further and recommend that it also be mandatory that the deputy minister, in such event, promptly advise the minister in writing of the safety concerns which are so communicated to him.

Communication within Senior Management

Mr Wightman, in his evidence dealing with the alternatives that a group head (assistant deputy minister) has when faced with an apparent lack of resources to meet program responsibilities, used the expression "hedging around." What he was referring to was an earlier examination of Mr LaFrance and a frustrating attempt on the part of virtually all counsel at this Inquiry to find the answer to an obvious question. That question was, Why didn't Mr LaFrance, as assistant deputy minister, knowing that his Aviation Regulation Directorate could not assure senior management that the air carriers were in compliance with safety standards and knowing that aviation safety was being jeopardized to the extent of justifying a memorandum to cabinet, not bypass the Program Control Board and go directly to his superior, Mr Withers, the deputy minister?

Mr LaFrance rationalized his actions by testifying that although he did not go directly to Mr Withers with his safety concerns, Mr Withers would have had the unfiltered information provided to him by the PCB:

- Q. ... Well, if the PCB reported to the Deputy Minister and you reported to the Deputy Minister, then when you went to the PCB to get these resources that you needed and you were denied those resources, did you then go to the DM and set out your plight to the DM?
- A. Well, as I mentioned in previous testimony, for a very specific purpose, the PCB and the DM were the same level, in a sense that, everything that I presented to the PCB was documented and I could review that documentation and correct it if I needed to, but I never did have to do that. And this is the documentation that was in front of the Deputy Minister
- Q. ... So the PCB wouldn't filter out documentation that you gave it? The presentations that you made to the PCB would go before the DM, is that right?
- A. There wouldn't be any filtering of the information that I provided. It was provided directly to the Deputy Minister as part

of that, and this is why I did not need to go to the Deputy Minister in a separate way.

(Transcript, vol. 163, pp. 94–95)

When cross-examined on the obligations of an assistant deputy minister to his superior, in the context of Mr LaFrance's resource situation, Mr Kenneth Sinclair was very clear on his understanding of the situation. There was absolutely no doubt in his mind as to the options that were available to Mr LaFrance if he was not satisfied with the resource allocation provided:

Q. He [LaFrance] is saying, I can tell you right now we need resources. My inspectors are overwhelmed with work. We have got all of this activity as a result of deregulation but you won't give me any resources until you've finished your study.

Isn't that what he's complaining about?

A. And he finds it's acceptable. And this is what I'm suggesting to you, sir, that as we tried to find ways and means to resource his concerns, we reached accommodation and he is saying right there, this is acceptable.

Q. Well, what choice does he have?

A. He could have gone to the Deputy Minister.

Q. All right.

A. He could have disagreed on the record.

Q. Well, ... isn't that, in fact, what he did? He said, all right, I will make the best – I will do the best I can with what you give me, but you should tell members of Cabinet that safety will be adversely affected? Isn't that what he did?

A. No, he's saying we should alert Cabinet of the potential of what is coming on and if I don't get my resources, this could affect safety and in our minutes we agreed to alert them.

(Transcript, vol. 165, pp. 123–24)

While the PCB may have agreed to alert cabinet of Mr LaFrance's safety concerns, apart from Mr Sinclair's earlier evidence regarding an omnibus Treasury Board submission, it is clear from the evidence that no such action was ever taken. The failure of the PCB to alert cabinet through the deputy and the minister of Mr LaFrance's safety-related concerns is inexcusable.

The issue of Mr LaFrance making his safety concerns known was pursued with the deputy minister of the day, Mr Ramsey Withers. Mr Withers was adamant that Mr LaFrance had not expressed these concerns to him directly:

A. The facts are these: He never complained to me about the resource allocation he was given by the Program Control Board.

He never came and said, Look, it is not enough. I have to have more this year.

He never came forward and said, This situation is extremely bad. We are going to have to stop. We are going to have to slow down, or anything of that – and that is all I can say because that is all that happened.

(Transcript, vol. 164, pp. 146–47)

It is difficult to reconcile the stated actions of Mr LaFrance and Mr Withers with their apparent lack of communication on a matter about which they both claimed to be concerned. Mr Withers knew about the Douglas Report and he knew about the ADMR Review of June 1987. Yet there is no evidence that he asked Mr LaFrance for status reports on how the situation was being handled.

Mr LaFrance knew that Aviation Regulation was in trouble, yet he, by his own admission, did not go directly to his superior, Mr Withers, and put his plight on the table. He indicated that Mr Withers knew of the situation, and he inferred that there was no need for him to do more. Mr LaFrance and Mr Sinclair both testified that Mr Withers would have been provided with this information by the PCB. The mystery surrounding how or if Mr LaFrance's concerns over resource shortfalls were communicated to his deputy ministers becomes even more complex when one considers that Mr LaFrance responded to questions in this regard with conviction equal to that of his superior, Mr Withers:

Q. Do you feel that your Deputy Ministers at that time were made clearly aware of your concerns about the lack of resources and your inability to –

A. Yes ... in specific terms, they were aware of all that I formally represented through the Program Control Board, not only through discussions with the chairperson of Program Control Board, but through the minutes with all this information here would have been in front of the Deputy Minister.

So – and also in my discussions with two Deputy Ministers under whom I served, there was, certainly, an understanding of our concerns around the senior management table.

I didn't bring at that table the specific aspects, because the specific submissions, of course, went through this channel. But I do know that they were aware of the difficulties.

How they place this in the context of their broader responsibility is something that only they can answer.

(Transcript, vol. 163, p. 75)

It is unlikely that the facts surrounding the question of who told what to whom will ever be fully known. But one thing is certain, communication at the senior management level left a great deal to be desired. Mr

Kenneth Sinclair's view that each manager in the chain has an obligation to pass on any concerns that might have an impact on the safety of the travelling public is clearly the correct approach. According to Mr Sinclair and Mr Withers, no such concerns were expressed to them. However, the evidence is irrefutable that their own internal review agency (the ADMR) had indicated in its report in June 1987 that Aviation Regulation could not assure senior management that the air carrier industry was operating in compliance with safety standards. Furthermore, Mr LaFrance had asked that a memorandum to cabinet be prepared to alert cabinet ministers as to the impact of deficit reduction on flight safety. The PCB minutes corroborate Mr LaFrance's evidence in this regard. Both Mr Withers and Mr Sinclair, seized of pertinent and relevant information, should have been aware of the concerns facing the Aviation Regulation Directorate as a result of lack of resources.

In the case of the departmental responses to the Douglas Report and the ADMR Review of the Aviation Regulation Directorate, it was evident that the deputy minister and the assistant deputy minister satisfied themselves that plans to address these critical issues were being made, but they did not ensure that the action being taken was timely and appropriate in the context of the actual workload demands. A typical example, as identified in the Douglas Report, was the need for a Human Resources Study. A group formed to conduct such a study did not produce its first report until 1988. The recommendations contained therein might have produced some additional help for the Aviation Regulation Directorate in 1989. However, that help was urgently needed in 1985 and 1986.

I was concerned to hear in evidence the widely varying perceptions of Transport Canada managers, particularly at the senior levels, as to how they were to discharge their obligations to respond to expressed aviation safety concerns. I could find no departmental policy that sets out the position of Transport Canada in that regard. The lack of departmental policy and clear direction in this area was highlighted during the testimony of Mr Withers:

- Q. Well sir, I think the evidence, the sworn testimony is – it's basically uncontroverted and it is quite clear that he [LaFrance] went before PCB asking for resources that he felt he needed and he didn't get them.

Now, he didn't go the step further and come to you and that is where we have got two separate sets of opinion. We have your opinion which is, gee, I'm surprised. He should have come to me.

And on the other hand, we have Claude LaFrance's opinion which is, I relied upon PCB to trust my judgement; that was my forum for making my case. And I have to assume that every-

thing I said to the PCB, the Deputy Minister knew about because there was a direct link there. So, why should I waste his time going to the Deputy Minister?

Now you see that's the difference of evidence that we're getting here.

THE COMMISSIONER:

There seems to be a breakdown somewhere in the area pointed out by Mr Bailey and if you can give us some possible insight as to recommendations that might rectify such a thing happening in the future, it would be helpful, sir.

THE WITNESS:

Thank you, sir. I suppose that about the only thing I can say is reiterate the fact of the operation – the *modus operandi* and the body; that if at any time any person charged with one of these functions feels that he or she has not been properly dealt with or listened to, then they must ... go to the Deputy Minister.

...

THE COMMISSIONER:

Perhaps you hit the nail on the head. There should be some very clear direction to the ADMs that in such and such situation [they] should come to the DM.

(Transcript, vol. 164, pp. 191–92)

The difference of opinion on the subject of how safety concerns were to be communicated between managers at the highest levels in the department, and through their minister, is a cause for considerable concern. This kind of “misunderstanding” is unacceptable, particularly when, according to their own priorities, safety was number one. From Mr Wightman’s evidence, it appears that he, as the current assistant deputy minister, has no misunderstanding of his responsibilities in that regard. Nevertheless, a clear and unequivocal policy direction should be put in place at Transport Canada to ensure that all managers, at any level, are obliged to communicate promptly and unequivocally to their immediate superior, both verbally and in writing, any significant safety concern that could affect the Canadian aviation industry and public. Furthermore, I am of the view that the failure to do so should be subject to sanctions appropriate to the gravity of the circumstances.

Changing the Scope of the Aviation Regulation Program

By the end of the hearings of this Commission it became obvious that during the latter half of the 1980s the Aviation Regulation Directorate of Transport Canada became increasingly less able to cope with the certification, inspection, and surveillance workloads being generated by

the air carrier industry. It was equally obvious that they were not receiving and were unlikely to receive the resources necessary to fulfil their regulatory mandate. The Aviation Group produced their program resource requirements based on program needs, while the Program Control Board responded with allocations based on a very limited affordability. From at least 1985 until 1990, this process repeated itself each year. It is difficult to understand why someone did not face up to the fact that the rationale upon which the resourcing process was based was not only unsatisfactory, but was unrealistic. Either the resource levels had to be increased to meet the demands of the program, or the scope of the program had to be reduced to a level consistent with the resources available. Reducing the surveillance and monitoring program to match reduced resources, however, poses a major dilemma. To do so is to jeopardize the minister's commitment that aviation safety would not be compromised. Mr LaFrance, former assistant deputy minister, aviation, was asked if he had considered the possibility of reducing the scope of the program:

Q. During your tenure, was there any thought or any ability to reduce the scope of the program?

A. No, because from an Aviation safety point of view, the least damaging reductions would have occurred in the closures of some Air Navigation installations as I have mentioned. That this can be done through a reduction of service without increasing danger to aviation. That was the least damaging one.

If that was denied to me, I was certainly not going to recommend some other reductions that would decrease the margin of safety. I couldn't professionally do anything like that.

Q. And such things as decreasing the number of inspections, decreasing the audits?

A. No ... I was not comfortable with any decrease in that area. There was no, no evidence that would allow us to justify a decrease in the frequency of inspections to any substantial extent, certainly not in the kind of environment in which we were at the time.

(Transcript, vol. 163, pp. 80-81)

Whether decreasing the number of inspections and audits could be justified or not, the evidence shows that after 1988, audits did in fact decrease in number and quality and that in-flight inspections were, at best, minimal in number. This happened not as a result of any plan set out by management, but by default, because there was no one to do the work. During the hearings of this Inquiry in January 1991, Mr Newton's evidence provided some hope that Transport Canada management has finally recognized that the problem was not going to go away and that action would have to be taken:

- A. So as a manager I have, first of all, tried to get the resources to perform that additional workload. And I haven't been that successful. I have gained ... I have been able to obtain some 85 PYs in the last couple of years and if you think of that in a period of fiscal restraint, that has been a major accomplishment.

However, Mr Newton went on to say that growth continues to outstrip the allocated resources:

- A. But the problem has been that the growth has outstripped the resources that we have been able to obtain to the point that as a manager, recognizing that I probably cannot get more resources, I have started to redesign the program.

In other words, I have to offload from the Aviation Regulation program about 130 PYs worth of work to protect my staff from burnout, from excessive stress and anxiety, and to ensure that ... they are performing at a level that they can enjoy sustained performance.

(Transcript, vol. 161, pp. 83-84)

Mr Newton indicated that he was looking at ways to delegate certain air carrier inspector responsibilities to industry so as to free up inspectors for work that required more of a regulatory presence. Provided that it can be shown that such delegation will not result in a degradation of the level of proficiency within the industry or a lowering of the assessment standards through a less enthusiastic application by company check pilots, this would seem to be a sensible approach.

Mr Wightman completed a strategic review of Aviation Group in 1990. This resulted in an organizational change proposal dated January 1991 (Project 1682-342). The strategic review examined a fundamental question that should have been addressed at least five years earlier: Was the Aviation Group suitably organized to deal with an air carrier industry that had totally restructured itself over the past five or six years? It can be said with little danger of contradiction that Aviation Group was not suitably organized to deal with the industry restructuring as it was taking place after deregulation. Mr Wightman's evidence in that regard offers some encouragement for the future:

- A. From a strategic point of view, we felt that we were facing continuing resource constraints but, at the same time, an increase in demand for services; both the kind of services that have been referred to here as discretionary and non-discretionary services, although, I think there's been a certain amount of over-simplification there. We do, in fact, make people wait sometimes as attested to by some of the phone calls I get.

But ... we have concluded, and I will be very brief about this because a strategy can get a long time to discuss, but we have

concluded that we need to look at other ways of doing our business because we are unlikely to see large infusions of resources into the Aviation activity in the coming years; that is my best assessment now because of the continuing emphasis on deficit reduction.

(Transcript, vol. 166, pp. 68-69)

Mr Wightman, in his testimony, discussed a new approach to the development of an operational plan using a fixed financial target level. He was quite clear in his recognition that unfunded safety requirements must be identified at the highest level of management in the department. To this I would add that unfunded safety requirements must not only be identified, they must be resolved if the Canadian public is to be assured that the system remains safe. While concurring that it is necessary to make all possible effort to structure a regulatory program that recognizes economic reality, I also firmly believe that safety standards must be maintained. The evidence is clear that the present Transport Canada safety standards are minimum standards. I do not believe that the Canadian public is prepared to accept less than full compliance with such minimum standards. Such compliance can only be assured through adequate surveillance and monitoring of the air carriers by the regulator.

If monitoring and surveillance of the aviation safety standards of Canadian air carriers are to continue to give way to fiscal restraints, this properly should be accomplished by way of reduction of the scope of the regulatory program, with clear notification to the Canadian public as to what compromises are being contemplated and what is transpiring.

It should also be noted, as is reflected in a recent Transport Canada internal report entitled "Evaluation of Aviation Regulation and Safety Programs," that there would likely be a greater safety benefit if regulatory efforts were to focus on operations deemed to be of a higher risk category. The report states as follows:

The higher risk operators or individuals, who persist in unsafe practices (as contrasted with lesser regulatory violations), would be dealt with in the most meaningful way.

This finding would imply a move away from a focus of compliance with regulations, which almost of necessity has to be an across-the-board activity, to focus more directly on risk and safety.

(Exhibit 1323, p. 13)

Surely the purpose of compliance is the reduction of risk and the enhancement of safety. Focusing on higher risk operators is nothing more than good management of regulatory resources. I would go one step further and suggest that consideration should be given to some

form of incentive to operators who have consistently demonstrated an exemplary safety record and a high operating standard through their in-flight inspections, audits, and the quality of their manuals and training programs.

According to the evidence of Dr Robert Helmreich during the human performance phase of the hearings, the FAA is attempting to stimulate United States carriers, through incentives, to adopt training programs based on line-oriented flight training (LOFT) in a total crew environment. An advanced qualification program (AQP) that includes LOFT as one of its components has recently been introduced in the United States. This program encourages the expansion of cockpit resource management programs to include all crew members. Based on the evidence I have heard from numerous aircraft crew members during this Inquiry, I am of the view that an AQP-type program is worthy of consideration and should be monitored by Transport Canada with a view towards its adoption in Canada. I would stress that any incentive program offered to carriers should be based on rigorous criteria carefully screened by Aviation Regulation staff to ensure that incentives granted are fully warranted. Such incentives are discussed further in chapter 39, Crew Coordination and Passengers' Safety Concerns.

Air Carrier Certification/ Surveillance Reporting Systems

As early as 1984, when the new domestic air policy was announced, there were documented concerns regarding the ability of the Aviation Regulations Directorate to respond to the anticipated increase in demand-driven certification and surveillance work. Throughout the Transport Canada phase of the Inquiry, evidence was placed on the record indicating that up to 80 new carriers were being certified annually, and that a six-month to one-year backlog in approval of flight operations manuals, training manuals, and minimum equipment lists was resulting in increasingly strident complaints from carriers. Unfortunately, there does not appear to be in place an effective reporting system that would allow senior managers to stay on top of demands being imposed on their staff.

During the testimony of Mr Ian Umbach, it was revealed that in July 1990, Transport Canada's in-flight inspections on international and continent-wide flights had virtually ceased as a result of a depleted overtime budget. Mr Umbach agreed that such a cessation of surveillance greatly reduces the margin of safety in the industry (Transcript, vol. 139, p. 60). Nevertheless, when the director-general of aviation regulation, Mr Weldon Newton, testified before the Commission on

January 16, 1991, he admitted that he was unaware that Transport Canada had ceased surveillance on international and continent-wide flights. When asked why he did not know the status of the situation, Mr Newton testified:

- A. I guess the nature of the program is such that I don't ask my directors every day about every component of their programs. I go on the basis that if they're having difficulties that they'll bring these things to my attention; be it Airworthiness, be it Licensing, be it whatever. If there's problems, I'd like to know about them.

(Transcript, vol. 162, p. 7)

It appears that the flow of information available to Transport Canada's senior managers is subject to the discretion of the directors. If there was no complaint, then it was assumed that no problem existed.

It is clear from all of the evidence that a similar attitude prevailed at the highest level within the department. Even though the deputy minister, Mr Withers, had received warnings from his own internal audit review group that Aviation Regulation was in severe difficulty, he did not insist that his managers inform him of safety-related problems. As he explained in his evidence:

- Q. And, therefore, it's your evidence that you were unaware that your Aviation Group was not getting the resources that they felt they required?
- A. I want to put it the other way. I want to state that I knew that they weren't ... getting everything they wanted, but I also knew that they were getting enough to be able to do the job the way he felt he had to do it in Aviation.
- Q. Well, how did you know that, sir?
- A. Because he never –
- Q. What source did you have for that?
- A. He never complained to say that he didn't, did he?
- Q. So your touchstone is that unless he came to complain to you, he must be getting enough?
- A. That is right.

(Transcript, vol. 164, p. 120)

Based on senior management's apparent lack of knowledge of the severe difficulties being faced by the inspector staff, it is obvious that reliance exclusively on the discretion and the reporting of safety concerns by immediate subordinates proved to be less than satisfactory.

It would seem almost elementary in management practices that all responsible Transport Canada managers would seek out or have at their disposal knowledge of the current demands being imposed on branches of the department for which they have responsibility. This is particularly so in those areas that have been identified as being critical to aviation safety. This expectation would have most certainly applied to air carrier certification and surveillance. Maintenance of a data base in those areas would facilitate quick identification of increased or decreased demand, which could be related to response ability. Resource needs would not then be based on perceptions alone, but on empirical data. According to the evidence of Mr Slaughter, efforts are currently being made to put in place two computerized information systems: national aviation company information system (NACIS), and audit information reporting system (AIRS). It is recommended that the data bases developed also include demand indicators that accurately reflect, on a real time basis, the workload being imposed on their own regulatory organization. These reports should be consolidated and produced for senior management consumption. In that way no one would be able to say they did not know because no one told them.

Policy Development: Impact Studies

According to an article written by Mr Lloyd Axworthy, the minister of transport in 1983-84, the first signal of government approval of a relaxation of domestic economic air policy was contained in the December 1983 Speech from the Throne. Mr Axworthy wrote:

As CATA [Canadian Air Transportation Administration] and the CTC [Canadian Transport Commission] were opposed to reform, I built a policy unit in my own office. An official was seconded from Privy Council Office, an assistant was assigned full time to the task, a consumer advocacy lawyer was retained for counsel, and contracts were signed with several academics.

(Policy Options Politiques, April 1985, p. 17)

The creation of such a policy unit in the minister's office may have served him well by excluding CATA and CTC opposition to reform. It may also, however, have denied him warnings of the aviation safety impact to be expected in association with such reform and about which the public servants of his department were well aware. Indeed, the impact studies produced by the Ontario Region office were completed not as the result of a request from any headquarters policy unit, but, rather, on the initiative of the region's senior management. The government announced its new air policy in May 1984. The Ontario

Region submitted its impact study to Ottawa in July of the same year, two months after the policy was in place.

With the change in government in September 1984, the policy was further developed to cover other modes of transport as well. In July 1985 the new minister of transport tabled a transportation policy paper called *Freedom to Move: A Framework for Transportation Reform*. As in the case of the Axworthy reform, this policy also carried with it implications that would be felt in many areas, not the least of which was safety regulation. Mr Kenneth Sinclair, chairman of the PCB, was examined on the need to conduct comprehensive impact studies as an integral part of the policy development process:

Q. Sir, from your perspective and from the experience which you have, do you think that it is wise, sir, to do thorough impact studies and thorough implementation plan studies before a new policy is ventured into and implemented?

A. Yes, I would agree – not only do I agree, it is compulsory now in the development of putting forward a policy proposal that the resource implications be included in terms of implementation costs and downstream costs.

Q. Sir, do you think that this kind of impact study and, indeed, an assessment of an implementation plan was carried out as fully as it should have been during the years '84 and on, as we ventured into this new arena of Economic Regulatory Reform?

Do you think that that was sufficiently done by the internal bureaucracy of Transport Canada?

A. I wasn't sure. So I asked the Deputy Minister, Mr Withers, and his advice to me was that he was satisfied that there was no clear evidence that the resourcing strategies weren't adequate.

Q. And that was the Deputy Minister's advice to you, sir?

A. It was.

Q. In what year, if you can recall, would that have been, sir?

A. That was at the time of the whole ERR issue coming forward to us. And that would have been, I think, Oh, within a year of my becoming chair of the Program Control Board.

Q. So it must have been around –

A. About '87.

(Transcript, vol. 165, pp. 71–72)

Findings

- The need for increased resources within the Aviation Regulation Directorate to meet the growth and demands expected to be generated by the policy of Economic Regulatory Reform was

predicted and well documented in several reports and studies in the period prior to 1984 and thereafter.

- The Ontario Region's impact study of July 1984, conducted on its own initiative, identified serious emerging resourcing and staffing difficulties within the Aviation Regulation Directorate.
- The Nielsen Task Force strongly recommended in September 1985 an immediate increase in resources in the area of air carrier inspection.
- The 1986 Douglas Report set out the serious difficulties encountered in the United States as a consequence of deregulation, and identified emerging Canadian resourcing and staffing problems expected as a consequence of the introduction of Economic Regulatory Reform.
- The deputy minister's internal audit review group, in June 1987, issued a report that stated that the Aviation Regulation Directorate was at that time unable to provide senior Transport Canada management with sufficient assurance that the aviation industry was in compliance with existing safety legislation, regulations, and standards. In spite of these indicators, the deputy minister remained of the opinion that the resourcing strategies for the Aviation Directorate were adequate.
- Based on the evidence before this Commission, the Transport Canada resourcing and staffing strategies, since 1984, have been inadequate to meet the needs of the Aviation Regulation Directorate.
- Based on the evidence before this Commission, there is no indication that any impact studies pertaining to safety regulation were carried out or requested by the Transport Canada policy development group that produced the 1985 transportation policy paper.
- Of equal importance was the need for Transport Canada to conduct similar impact studies on safety regulation in the context of deficit reduction.
- The effect of Economic Regulatory Reform, combined with deficit reduction or, more specifically, the five-year Memorandum of Understanding between Transport Canada and the Treasury Board, created a synergy that, in my opinion based on the evidence before this Commission, had an adverse impact on the effective application of safety standards.

- There is no evidence of any in-depth examination by Transport Canada of the effects of downsizing in the face of a major restructuring of the air carrier industry that was to take place following the introduction of Economic Regulatory Reform.
- There is an urgent need for a system within Transport Canada to enable the fast-tracking of additional qualified personnel into critical areas involving aviation safety, when required.
- The multi-level resource-request challenge process employed by the Aviation Group of Transport Canada is an unduly cumbersome and time-consuming process ostensibly designed to identify and justify absolute minimum resource requirements.
- The Program Control Board, which was faced with resource restrictions after the introduction of Economic Regulatory Reform, did not respond appropriately to aviation safety-related resource concerns that were brought to its attention by the Aviation Regulation Directorate.
- The senior management of Transport Canada, Aviation, has been shown by the evidence not to have responded adequately to aviation resource concerns being expressed by lower and middle management regarding their inability to meet program responsibilities, particularly in the area of air carrier inspections, monitoring, and surveillance.
- It is not my intent to criticize the right of a government to embark on a policy of economic deregulation of the air carrier industry. Nor would I suggest that it is improper to attempt to reduce the size of the national deficit. It is the combined effects of these policies, as they relate to the safety of the public, that causes concern. The policies are not faulted in any way, but their application and overall administration left much to be desired.

RECOMMENDATIONS

It is recommended:

- MCR 118 That Transport Canada, as an integral part of any future policy development process, ensure that thorough impact studies be carried out by experienced analysts, knowledgeable in the subject matter, as a prerequisite to government acceptance and implementation of policies that could have a bearing on aviation safety.
- MCR 119 That, where a potentially adverse effect on safety is identified, appropriate measures be taken by the government to preclude the effect before the policy is implemented.
- MCR 120 That all senior Transport Canada Aviation Group managers have at their disposal knowledge of the current demands being imposed on branches of the department for which they have responsibility.
- MCR 121 That Transport Canada encourage all Aviation Group managers, at any level, to communicate to their superiors any significant aviation safety concern that has come to their attention and that could affect the Canadian aviation industry and public.
- MCR 122 That Transport Canada put in place a policy directive that if resource levels are insufficient to support a regulatory or other program having a direct bearing on aviation safety, the resource shortfall and its impact be communicated, without delay, to successive higher levels of Transport Canada management until the problem is resolved or until it is communicated to the minister of transport.
- MCR 123 That an air carrier activity reporting system providing a current and reliable picture of the industry be developed and utilized by Transport Canada to determine program resource needs, levels, and direction.

- MCR 124** That the process of resource allocation, including staffing standards, be re-examined by Transport Canada with the following objectives:
- (a) To establish a staffing standard based on realistic and measurable task performance and frequencies and accepted standards of time required for such tasks.
 - (b) To reduce the challenging levels from the present seven or more to a lower, more realistic level.
 - (c) To establish a resource contingency factor for aviation regulation that can, at the discretion of senior management of Transport Canada, be called upon to provide additional resources to meet exceptional safety-related circumstances.
- MCR 125** That Transport Canada examine the role of the Resource Management Board, formerly the Program Control Board, with a view to attaining the following goals:
- (a) To ensure that the deputy minister of transport will be informed of all aviation safety implications of any resource reductions or denials recommended by the Resource Management Board.
 - (b) To ensure that within the Resource Management Board and its secretariat there is an individual with aviation operational expertise who is cognizant of safety implications in resource reduction programs.
 - (c) To ensure that members of the Resource Management Board understand the implications of personnel reductions below the minimum level prescribed by accepted staffing standards.
 - (d) To ensure that the deputy minister of transport be informed of each instance in which the Resource Management Board or its secretariat returns plans to Transport Canada group heads asking for further justification of resource requirements for aviation safety-related items.
- MCR 126** That Transport Canada's Aviation Regulation Directorate develop a system that focuses resources on the areas of highest risk.

32 AUDIT PROGRAM

Transport Canada had conducted an audit of Air Ontario in October 1988, five months prior to the Dryden accident. As set out in Part Five, the period 1987–88 was a particularly volatile time at Air Ontario. The recent merger, pilot strike, and introduction of the F-28 were a few of the destabilizing factors at that time. Had a thorough and complete audit of Air Ontario's operations and maintenance departments been performed by Transport Canada during this critical period, it would have provided valuable insight into the health of the company, and the audit team would have been well situated to identify deficiencies.

As it happened, the Air Ontario F-28 operation was not audited in the October 1988 audit. This serious shortcoming, in concert with other problems in Transport Canada's organization and execution of the audit, severely limited its effectiveness. The inadequacy of the audit represented a significant breakdown in the safety system that should have protected the passengers and crew of Air Ontario flight 1363 on March 10, 1989. Accordingly, a thorough investigation was warranted of the 1988 audit of Air Ontario (see chapter 33), and, more generally, of Transport Canada's inability to deliver its National Audit Programme effectively.

National Audits

Transport Canada's revised Manual of Regulatory Audits (1990) defines an audit as "An in-depth review of the activities of an organization to verify conformance with current regulatory standards and practices" (Exhibit 963, p. 1-1). These audits are conducted pursuant to the *Aeronautics Act*, c.A-2 and c.33, s.4.2(K), which empowers the minister to "investigate, examine and report on the operation and development of commercial air services in, to, or from Canada."

At the time of the Air Ontario audit, the director-general, aviation regulation (DGAR), was responsible for all aviation regulation audits and inspections. This responsibility was further delegated to the director of flight standards, the director of the Airworthiness Branch, and the regional directors of aviation regulation.

An audit is one of a number of devices available to Transport Canada to monitor regulatory compliance and the general health of Canadian air carriers. In this regard, an audit program serves as an important

preventive measure in preserving the public trust in the safety of civil aviation.

Typically, audits involve a team of air carrier and airworthiness inspectors who, over a period of about two weeks, comprehensively review and monitor an air carrier's operations, including record keeping. An audit report, containing the "non-conformance" findings and recommendations of the audit team, is compiled and presented to the audited company within 10 days of completion of the audit.¹

The regional director, aviation regulation, for Ontario Region, Mr Ronald Armstrong, capsulized in his evidence the reason for audits:

- A. The purpose of the audits is to take what you'll hear lots of us refer to as a snapshot of a particular carrier and their state of health at a particular point in time. We get the running movie picture of the state of health of that company through our day-to-day activity with those carriers, but as the inspectors are only looking at a one-of event at any given time, one PPC, testing the product of the training process via looking at the pilot's performance, or looking at a particular aircraft and testing the maintenance capabilities of that company by looking at the maintenance and airworthiness of that aircraft, we'd go in and look at a systemic approach when we're doing an audit. And that's what it's mainly about. It's to look at the company's systems and see whether there are any deficiencies in those systems.

At the same time, there will be an examination of the product of that company, the pilot, the cabin attendant and the aircraft, as part of an audit – as part of a large audit, not necessarily the smaller audit.

(Transcript, vol. 124, p. 167)

Under the National Audit Programme (NAP) (1983–90) it was intended, although seldom achieved, that headquarters would conduct three national audits per year and that each national carrier would be audited every three years. Under the 1990 revised Manual of Regulatory Audits (Exhibit 963), the frequency of air carrier audits depends not only on how much time has elapsed since the last audit, but also on the carrier's regulatory compliance and safety record. The manual sets out that carriers are to be audited every six to 36 months and that all carriers are to be audited six months after initial certification. In determining audit frequency within the six- to 36-month time period, the convening

¹ Non-conformance is defined in the revised Manual of Regulatory Audits as follows: "deficiency in characteristics, documentation or procedure which renders the quality of a product or service unacceptable or indeterminate."

authority is to take account of the following risk management indicators that are intended to highlight potential problems in an air carrier:

- financial/labour/management difficulties
- poor internal audit/Quality Assurance programme
- change in operational scope or additional authority
- large change in contracting
- high turnover in personnel
- loss of key personnel
- addition to or change in product line
- poor accident or safety record
- merger/takeover, and
- previous audit history.

(Manual of Regulatory Audits, p. 1-12)

National versus Regional Audits

Transport Canada's first national audit was conducted on Air Canada in 1983. Prior to that time, audits, which were formerly referred to as base inspections, were convened and conducted solely at the regional level. In developing the National Audit Programme, Transport Canada headquarters assumed the responsibility of auditing Canada's larger carriers. This new audit program, however, did not drastically alter the status quo. National audits are basically similar to regional audits, the fundamental difference being the location of the convening authority. Mr Armstrong expanded on this distinction in his testimony:

- A. National audits and regional audits are ... the same, it just means who's doing them. Where is the convening authority located, and national audits would be conducted on those, if we're speaking air carriers, those air carriers which are regulated out of the seventh region: Air Canada, Canadian [Airlines International], Canadian Helicopters, those would be done as a national audit basis, with an audit manager and possibly team leaders from headquarters with ... working level resources coming from wherever they can obtain them in the organization, be that headquarters or regionally.

Regional audit, the convening authority would be either myself [Ontario Regional manager] or the regional managers, and being resourced, again, most often out of the region but occasionally with resources from other regions.

(Transcript, vol. 124, pp. 171-72)

Mr Henry Dyck, superintendent of large aircraft inspection, airworthiness, based at Transport Canada headquarters, was centrally involved in the incipient stages of the NAP. He also served as the manager of the

Air Ontario audit in 1988. Mr Dyck testified that the NAP did not establish a dedicated team to administer and conduct national audits. Instead, this substantial undertaking was added to the burgeoning workload of Mr Dyck and his staff in the Airworthiness Branch, as well as to that of his headquarters counterpart in Air Carrier Inspection. In October 1985, after the completion of five national audits, Mr Dyck aired his dissatisfaction with the NAP in an internal memo to his supervisor, Mr Roger Beebe, chief of airworthiness inspection in the Airworthiness Branch:

I have supported these audits in concept, but I have also spoken out about the lack of availability of PYs [person-years] to carry out these audits under the existing staff allocation. We (ABMA) can no longer carry out national audits and continue to complete other work with any degree of efficiency. I cannot expect my staff to formulate policy and write staff instructions, (our main function), when they are busily engaged in national audits and the subsequent follow-up work.

(Exhibit 1052)

In the same memo, Mr Dyck went on to recommend the formation of a permanent national audit team, not only to alleviate his own workload, but, as he added, "the permanent audit team would certainly be beneficial in concept to prepare and cope with the situations arising out of deregulation, i.e. the upcoming merger of CP Air, Nordair, EPA, and maintenance contracting to outside agencies, etc., etc." Although Mr Beebe responded to Mr Dyck's memo, his response did not address the proposed establishment of a permanent national audit team, nor did it satisfy Mr Dyck's concerns regarding deregulation.

By 1988 it had become clear that Transport Canada was experiencing acute difficulties in delivering its NAP. The issue came to the fore in January 1989, as a result of a series of internal Transport Canada memoranda that requested that no national audits be scheduled for fiscal year 1989/90 because of a lack of resources and an overwhelming workload. In a memorandum to Mr William Slaughter, director of flight standards, dated January 20, 1989, a memorandum commonly referred to as the "MacGregor Memo," Mr Neale MacGregor, acting chief of operations and certification, argued for a deferral of all national audits because of the "critical" situation in Air Carrier Inspection:

The plan for the coming fiscal year was to conduct National Audits on Air Canada and Wardair. The size and scope of these two audits would completely denude AARCBA [Large Air Carrier Operations – Headquarters] of staff for up to a month at a time, and would make it impossible to review and approve the many documents required for certification (Operations Manuals, Training Manuals and

MELs), or carry out non-discretionary commitments such as initial check-outs, captain upgrades and CCP monitorings.

(Exhibit 1106)

Another serious impediment to the continued functioning of the NAP was revealed in a memo dated April 19, 1989, from Mr Beebe to his superior, Mr James Torck, director, Airworthiness Branch. What had been established as a joint venture between headquarters' Airworthiness and Operations groups had deteriorated. In his memo, Mr Beebe strongly asserted the Airworthiness Group's frustration and dissatisfaction in working with Operations and called for a rethinking of the program. As the following excerpt from the memo indicates, the audit of Air Ontario in 1988 (as discussed in chapter 33) exemplified the shortcomings of the Operations Branch:

You may recall that the NAP was set up as a response for a uniform and consolidated approach to auditing the airline industry. At the time of its inception and to best address the administrative aspect of the program, Airworthiness relinquished the OPI [Office of Primary Interest] role to the Operations Branch. However, it would appear that this arrangement isn't meeting its intended goal. There are numerous indications pointing to the Operations Branch – falling short of delivering a quality program. Most recently the Canadian Airlines International Limited (CAIL) and Air Ontario National audits have failed to deliver their final reports within the prescribed time frames. In both instances, Airworthiness had completed their portion of the report, on time and delivered on schedule.

...

... This unwarranted delay has compromised the intent of the audit and seriously detracted from its credibility.

(Exhibit 1093)

Mr Slaughter has held the position of director of flight standards since January 1988 and bears principal responsibility for the audit program. When he took up his new position, he realized that the audit program was "very poor" and in need of reform:

- A. ... I think it's become quite clear, and it was at the time, that as it progressed or immediately after the time, that the audit function that I had assumed when coming into the position was in place, was really less than ideal. In fact, it was very poor. I was most displeased with the whole audit process.

And that, of course, came to light with such audits as the Air Ontario audit amongst one or two others. And for this reason, I took action to restructure the audit program to bring it into being more functionally responsible and responsive to our

requirements as a regulatory agency and to the requirements of the industry.

So that, fundamentally, that was what led to the creation of the audit program as we have it now.

(Transcript, vol. 144, p. 27)

In 1989–90, in response to these and other concerns, the NAP was scrapped and audits were returned to the purview of the regions. These changes were in keeping with a new policy whereby headquarters assumed strict responsibility for development of policy and standards while the regions applied and enforced these standards. Nevertheless, the change to the audit structure does not appear to represent a significant departure from the previous order. Many of the carriers that would have been audited by the NAP now fit within the headquarters-based Seventh Region.

In addition, headquarters assigned four person-years, two each from Operations and Airworthiness, and created a permanent audit management team. Although termed audit management, this new group should not be confused in title or function with the audit manager appointed for each individual audit. Rather than participating in audits, this new group became responsible for developing the revised Manual of Regulatory Audits, reviewing the audit training of air carrier inspectors, and monitoring the regions in their conduct of audits.

Finally, in November 1989, the regional directors decided that Airworthiness and Operations should conduct their audits separately rather than jointly. This decision was commented on in a January 1990 document entitled “ADMA [Assistant Deputy Minister Aviation] Action Plan: Regulatory Audits”:

The consensus was that 80% of the aviation companies would never rate the time and effort of a combined audit and that specialist (flight standards or airworthiness) audits should henceforth be considered the norm.

This approach has the advantage of allowing more resources to be directed to the problem areas, as well as increasing the number of companies that are likely to receive at least one annual check. At the same time, companies who receive a poor report in the specialist audit would be targeted for more attention, including a combined audit, if warranted.

(Exhibit 1322, Annex 7)

While this policy of separating Airworthiness and Operations audits may reduce the opportunity for conflict between Airworthiness and Operations personnel, it also takes away the benefits of combined audits – most notably the ability to get a truly comprehensive picture of the

company at one time, as well as the ability to address most effectively matters of joint responsibility.

Audit Manuals

In 1986, under the auspices of the director-general, aviation regulation, work began on an audit policy manual entitled Manual of Regulatory Audits (MRA). The office of prime interest (OPI) for the MRA – that is, the responsibility for its coordination, production, distribution, and amendment – rests with the director of flight standards (formerly the director of licensing and certification). A number of draft MRAs were produced and disseminated in the intervening years but during the hearings of this Commission, in December 1990, it was disclosed that the document had never received final approval. Two versions of the MRA were tabled before this Commission: the first (Exhibit 1034), dated June 25, 1987, was most likely used by the team that audited Air Ontario in 1988; and the second (Exhibit 963), compiled in 1990 by the newly appointed audit management team, is the most recent version of the MRA. It received approval on January 23, 1991, soon after the completion of the hearings of this Commission.

Mr Dyck testified that the MRA was not used as a primary document by auditors but, rather, was used as a reference document. Another document, the Audit Procedures Handbook (Exhibit 1033), although produced as a manual for auditor training, was more often used as a field document by inspectors. It was, in fact, also used by the audit team who audited Air Ontario.

Evidence given before the Commission revealed some confusion as to the status of these documents and their co-relationship. The MRA had been in existence in its various incarnations and had been widely circulated for approximately five years, but it had never been approved. The handbook, though widely used and circulated, was a training document. While no apparent conflict in policy or procedure between the manual and the handbook came to light, the lengthy approval process for the MRA, as well as the overlap in the documentation, reflects poorly on Transport Canada's management of its audit program.

Audit versus Other Compliance Checks

Audits are an important regulatory tool for measuring the safety level of a company at a particular point in time. Because Transport Canada's audit of Air Ontario just five months before the Dryden accident did not cover Air Ontario's F-28 program, the overall efficacy of the audit was brought into question and a thorough investigation of it was undertaken.

However, the degree of attention paid to the audit by this Commission should not be interpreted as in any way minimizing the value of other regulatory checks such as in-flight inspections, pilot proficiency checks (PPCs), and instrument rating renewals.

In addressing the value of audits relative to other compliance checks, and as is discussed in chapter 30 of this Report, *Effects of Deregulation and Downsizing on Aviation Safety*, Mr Ian Umbach, the superintendent of air carrier operations, rated in-flight inspections as a more valuable regulatory tool than audits:

- Q. Can you describe the value of audits, in your mind?
A. Audits have a place in our monitoring and surveillance system. They are designed to ensure that the carriers record-keeping and infrastructure is acceptable, and they do have value.

However, I feel that other things, such as in-flight inspections and PPCs, have more value.

Certain audits, for example in the certification process, are very high value. An audit after a merger has a very high value.

But a routine audit, I consider about midway to the bottom third of our, say, a scale of our inspection priorities.

(Transcript, vol. 138, pp. 101–102)

Mr Slaughter generally agreed with this:

- A. ... the point I would like to make is that I see an audit as being part of a ... program of checks on the carrier.

...

I heartily agree with the testimony that indicated that an in-flight inspection is probably one of the better methods of looking at ... the operation of that particular flight. And a series of these gives a great monitoring of the industry. And I think that's a very effective tool to use.

... my own opinion is that an audit has a place in the overall surveillance program, not the only place. I don't think we can get rid of the other things and concentrate only on audits, but by the same token, I don't think the other things in isolation has quite the same impact as included audits in the overall program.

So fundamentally, the reason I put it in number 5 is that I have a little ... more confidence in the audit program, and secondly, it has been a recognized part of the directorate's thrust on regulating the industry ...

- Q. But what you are saying, Mr Slaughter, is that the audit per se is only one piece of an entire system which you would like to see in place; am I understanding you right?
A. Yes, that's right, sir.

(Transcript, vol. 144, pp. 74–75)

To deliver an aviation safety program such as the audit effectively, it is imperative that the program be thoroughly planned, ably managed, and adequately funded. Inspectors involved in an audit must be well trained and conversant with the audit's objectives and procedures.

These necessary ingredients were rarely seen through the life of the National Audit Programme – from its inception in 1983 to its dissolution in 1989. However, it appears that the problems that were experienced in the audit of Air Ontario in 1988, and which were exposed and analysed before this Commission, have jolted Transport Canada into taking action to rectify the deficiencies in its audit program. The revised Manual of Regulatory Audits, issued by Transport Canada in 1991, provides some organizational improvements to reduce the confusion that at times characterized the 1988 audit of Air Ontario, which I address in chapter 33.

AUDIT OF AIR ONTARIO INC., 1988

Transport Canada's Ontario Region was, at all material times, responsible for monitoring and inspecting the day-to-day operations of both Air Ontario Ltd and Austin Airways. Soon after the two companies merged in June 1987 to form Air Ontario Inc., Ontario Region began to plan an audit of the new entity. Because mergers often result in significant and complex changes in companies and because Air Ontario Inc. was also in the process of introducing a new aircraft type, Mr Donald Sinclair, Ontario Region's manager of air carrier operations, and Mr Martin Brayman, Ontario Region's superintendent of air carrier inspection (large aeroplanes), thought that it was an appropriate time to conduct an audit. As Mr Sinclair explained in his testimony:

- A. The decision [to audit Air Ontario] was based on the fact that they were undergoing this melding process of Air Ontario Limited and Austin Airways Limited. We wanted a snapshot in time as to how the company was coming.

...

We had two diversely different operations being melded into one. We had ... what started out to be a bush operation way back by the Austin family which was operating principally up and down the coast of the [Hudson] Bay, we had it melding with a very neat scheduled operation in southern Ontario with larger airplanes.

- Q. Why would this cause you concern?
- A. How the two were going to meld together under one operational control, under one chief pilot, under one director of maintenance, et cetera.

(Transcript, vol. 142, pp. 63-65)

After Economic Regulatory Reform (ERR) was implemented in 1985, the workload of Transport Canada's inspectors increased dramatically (see chapter 30, Effects of Deregulation and Downsizing on Aviation Safety). Mr Brayman explained that the decision to audit Air Ontario in 1988 reflected Ontario Region's concern over its ability to execute its mandate under the strain of ERR:

- A. During this period, we were under a great deal of stress, and there is no question we were worried that there might be some cracks in the door, that something might slip by us. We were

hoping to use the audit as a back-up tool to ensure that that didn't take place.

(Transcript, vol. 132, p. 221)

Organization of the February 1988 Audit

Initially, Mr Sinclair had planned to conduct a regionally based, in-depth, joint Operations Branch and Airworthiness Branch audit commencing in November 1987. As planning for the audit progressed, however, the audit was elevated from a regional to a national audit and rescheduled to February 1988. Ultimately the airworthiness portion of the audit went ahead in February 1988 while the operations portion was further postponed until October 1988.

Mr Brayman indicated that although the proposed audit of Air Ontario was first conceived as a regional audit, Ontario Region actually favoured some degree of headquarters involvement. Such collaboration would not only ensure the independence of the auditor from the carrier (Ontario Region was involved with Air Ontario on a day-to-day basis), but would also assist Ontario Region, which did not have the personnel needed to do the job:

- A. I think at the time we were very short of personnel and we didn't feel that we could put together an audit team in region, so we turned to the national audit team and requested they do the job for us.

(Transcript, vol. 132, p. 3)

The involvement of headquarters and the upgrading of the audit to a national audit was not free of conflict. Because Transport Canada did not have permanent audit staff to assign to the audit, inspectors had to be recruited from various regions, including headquarters. However, the absence of an inspector seconded to an audit for two to three weeks inflicted tremendous strain on the affected headquarters or regional office already overworked because of ERR-related demands. When Ontario Region requested that headquarters provide an audit manager to ensure that this key position was held by someone not otherwise involved with Air Ontario, the request was accepted by Mr Donald Douglas, director of licensing and certification. He then made a specific request for Mr Henry Dyck to be made audit manager to Mr James Torck, headquarters director of airworthiness, who turned down the request in a memorandum of November 26, 1987:

We are unable to accommodate your request because of other ERR related priorities and the possible national audit of Okanagan

Helicopters in February. We also understand that PARD [Ontario Region] is able and willing to assign an audit manager for this audit.
(Exhibit 1063)

In his testimony before the Commission, Mr Dyck expressed his own disinclination to participate in the Air Ontario audit and explained why he believed Ontario Region sought to include headquarters personnel in the audit. First, Ontario Region wanted to find auditors who had not been previously involved with Air Ontario. Second, although he believed that Ontario Region had the necessary manpower to do the audit, Mr Dyck described what he perceived to be an underlying feud between the Operations and Airworthiness branches at Ontario Region that precipitated the request to headquarters to supply the audit manager (see chapter 32, Audit Program):

- A. Well, again, as I recall it, and the conversation I had with the man at the time, Mr Al Bryson [Ontario Region superintendent of air carrier airworthiness], there was a bit of conflict ... between himself and the operations people as to who was going to do the audit. Call it inter-departmental feuding or rival – friendly rivalry is the best description.

...

... I asked, well, why aren't you doing the audit if you have the time and the people and the ability. And they [Airworthiness] said they didn't want them [Operations] involved in the process of it all.

(Transcript, vol. 135, pp. 107–108)

Ultimately, the planned Air Ontario audit was changed to a national audit, which was scheduled to run from February 16 to March 3, 1988. Mr William Slaughter, director of licensing and certification (which became flight standards), assumed the role of convening authority, Mr Dyck was appointed audit manager, Mr Peter Saunders, airworthiness team leader, and Mr Bruce Ingall, operations team leader. According to Mr Dyck, the audit was given national status because Ontario Region had not been able to obtain the required personnel and funds:

- A. ... To call it a national audit, that would mean that we could now recruit people from other regions to do the job.

From the perspective of the Ontario regional operations, people were not available or could not do the job, so they asked for additional help.

In order to do it, they elevated it to a national audit, and that way they could get additional funding and the manpower that would ... They perhaps wanted money to do it and they didn't have it.

Like I say ... I don't really know. From the airworthiness portion of it, the side of it, the people were there and they were available. So other than that, there was not much of a reason to make it a national audit.

(Transcript, vol. 135, pp. 113–14)

Audit Personnel: Selection and Training

A major shortcoming of the Air Ontario audit centred around personnel. From the start, there were difficulties in assembling inspectors to conduct the audit. The person eventually appointed as operations team leader had never before participated in an audit, let alone served as a team leader; the audit manager interpreted his responsibilities in a manner that conflicted with the Manual of Regulatory Audits (MRA); and the audit manager and the operations team leader were unable to work together effectively to complete the audit report in a timely manner.

Convening Authority

The convening authority is described in the MRA as “the manager responsible for authorizing a regulatory audit” (Exhibit 963, p. 1–3). Since national and regional audits were distinguished according to the location of the convening authority, once the Air Ontario audit became national, Mr William Slaughter, director of licensing and certification, was appointed headquarters-based convening authority by the director-general of aviation regulation.

The convening authority is responsible for convening the audit and appointing the audit manager and team leaders, approving the audit plan, and assigning audit follow-up activities. In addition, the audit manager is expected to keep the convening authority informed of pertinent audit matters (Exhibit 963, pp. 1–24 and 1–41).

Audit Manager

The MRA defines the audit manager as “an individual designated by the Convening Authority who is responsible for planning and overall conduct of the audit, up to and including production of the final Audit Report” (Exhibit 963, p. 1–1). The audit manager may be an operations inspector, an airworthiness inspector, or an airworthiness engineer, and should have the following qualifications:

- completion of the Audit Training Module provided by the Inspector/Engineer Training and Development Branch

- experience related to the type of operation to be inspected
 - experience with Transport Canada administrative procedures
 - no conflict of interest in relationship to the Auditee.
- (Exhibit 1034, Manual of Regulatory Audits, p. 1-2)

When the audit of Air Ontario became a national audit, Mr Dyck was appointed audit manager. He brought more than adequate training and experience to the task. Although it was his first appointment to the position, he had been a team member on a number of audits as well as the airworthiness team leader on the national audits of Air Canada in 1983 and Okanagan Helicopters in 1985. Moreover, he was involved in the establishment of the National Audit Programme in 1983, and validated, or critiqued, Transport Canada's Audit Training Module. In spite of his experience, Mr Dyck could not be described as an eager or willing participant. As the following excerpt from his testimony indicates, he reluctantly accepted the appointment in order to fulfil an obligation to alternate airworthiness and operations personnel as national audit managers:

A. ... I was directed by my boss to do it ... my boss [Roger Beebe, chief airworthiness inspector] and the other – and Mr Corkett [chief of air carrier operations] had agreed to share the responsibilities of audit manager and it was now our turn.

Although I declined it the first time and tried to decline it the second time, it was my assignment.

(Transcript, vol. 135, pp. 114-15)

The audit manager has the responsibility to plan, coordinate, and "maintain the integrity of the audit process" (Exhibit 1034, p. 3-1). More specifically, and as set out in the Transport Canada policy/guideline documents, the Audit Procedures Handbook (Exhibit 1033), the Manual of Regulatory Audits (Exhibit 1034), and the revised Manual of Regulatory Audits (Exhibit 963), the audit manager's responsibilities include maintaining contact with the convening authority, communicating with senior management of the auditee, exercising line authority over assigned audit staff, ensuring that all functions of the audit team have been completed prior to the release of the individual members, and preparing the draft audit report.

The revised Manual of Regulatory Audits, which was approved by Transport Canada on January 23, 1991, contains similar but expanded provisions on audit manager training requirements and responsibilities. This new MRA appears to have addressed some of the areas of concern that arose in the 1988 audit of Air Ontario and that are the subject of my commentary in this section of the Report.

Audit Team Leader

The MRA and the audit handbook set out the duties of an audit team leader: to maintain ongoing communication with the audit manager; debrief auditee management upon completion of the audit; become familiar with the company's policies, instructions, and procedures; and draft sections of the report as required by the audit manager (Exhibit 1034, pp. 3-2, 3-3). Neither manual, however, offers guidelines on required experience or training.

The revised MRA, in contrast, is far more explicit in this regard. It requires that a team leader have the same qualifications as an audit manager – that is, that he or she be a flight standards or airworthiness inspector, or airworthiness engineer, and have participated in at least two large audits as a team member (p. 1-56).

Where the audit is a joint Operations/Airworthiness audit, as was the case in the Air Ontario audit, there will be two team leaders: operations and airworthiness. At the time the Air Ontario audit team was being assembled, there was no Transport Canada policy document or guideline establishing responsibility for appointing team leaders. As a result, the appointment to this important position was carried out in a haphazard fashion and resulted in the formation of ineffective working relationships. Mr Dyck testified that he had no involvement whatsoever in the selections of Mr Bruce Ingall, and subsequently Mr Leonard Murray, to the position of operations team leader.¹ In contrast, Mr Dyck specifically requested Mr Peter Sanders, whose credentials he was familiar with, as his airworthiness team leader. Since Mr Dyck's experience was in airworthiness, he was more familiar with the pool of potential airworthiness team leaders than the corresponding group in operations. Partly as a result of these appointments, I believe, the airworthiness audit was conducted smoothly, while the operations audit was to some extent impeded by the discordant working relationship between Mr Dyck, the audit manager, and Mr Murray, the operations team leader.

The convening authority, Mr Slaughter, was also not involved in selecting the audit team members, including team leaders, preferring to delegate the responsibility to his staff. As Mr Slaughter's testimony indicates, he had no knowledge of the experience of the appointees:

Q. How are members of an audit team selected, sir? And let's now get back to the Air Ontario situation.

¹ Mr Ingall was appointed as operations team leader for the February 1988 audit. Because the operations portion of the audit was postponed, and not actually conducted until October 1988, Mr Ingall was unavailable and was replaced as operations team leader by Mr Murray.

...

Did you have any input after January '88 on team members?

- A. Not really, as I recall. I didn't have anything constructive to contribute at that point.

Although it was my authority, I really didn't know the individuals, didn't know the circumstances, so I went with what was offered to me, and respected the opinion of the people that offered them.

(Transcript, vol. 144, pp. 37-38)

The revised MRA improves on the previous situation in that it establishes clear procedures for the appointment of team leaders: "The Audit Manager shall select and designate Team Leaders in consultation with the CA [convening authority], and confirm their appointment in writing" (p. 1-56). Since the team leader reports to the audit manager, it is vital that the audit manager have confidence in his or her team leader. Had the team-leader selection provisions from the revised MRA been in place to guide the appointment of the operational team leader in the audit of Air Ontario, I am convinced that many of the problems that hindered the audit could have been avoided.

Audit Team Members

The MRA and audit handbook in effect in February and October 1988, at the times of the Air Ontario audit, did not outline the responsibility for or the procedure to be followed in securing appropriate audit team members. Yet, in the absence of permanent audit staff to conduct national audits, the process of assembling an audit team would necessarily be replayed for each audit. For this reason, it is in my view a glaring omission, and an invitation to controversy, that a system was not in place to ensure the orderly secondment of inspectors. When the initially appointed operations team leader, Mr Ingall, experienced difficulties in arranging a team, Mr Dyck, the audit manager, was called in to lend assistance. Mr Dyck testified as to the negative impact of this ad hoc approach:

- Q. Is there any established Transport Canada procedure or policy for national audits to recruit staff – to recruit team members?
- A. No, sir, there is not. It is strictly on an as-available basis. At that point it was.

The issue was addressed at the next audit, national audit meeting, and I suggested we create an on-call list. And I believe that matter was talked about further down the road as a result of this experience.

- Q. Okay, and did you find that to be a satisfactory state of affairs in getting audit members?

A. No, it's not. That was one of the constraints that we had to work under for this audit and all audits up to that point.

... you must appreciate that these audits are an ad hoc project and we do not have full-time staff members assigned, so we have to solicit the help of regional staff to do the function with.

(Transcript, vol. 135, pp. 147-48)

Without question, because of the pressures created by ERR, there was a severe shortfall of available, trained personnel to serve as audit team members. This was exacerbated by an inadequate system of accessing these inspectors for audit duty. Mr Dyck commented that his greatest staffing problem was trying to acquire operations inspectors, which was described as a "beg, borrow, and steal" situation:

Q. Well, was it – to use a common expression, was it a beg, borrow and steal operation that you were on, to try and get the personnel you needed to do this operations audit?

A. Well, that was an expression I used at some time, yes.

I would phone the regional director and I would state my case, I need a body to do a certain function, and the response would go something like, yes, give me a minute, I will phone you back in a day or two and see what I can do.

And the response would come back, well, this guy is free, you can have him for "X" number of days. That type of scenario is what I encountered.

(Transcript, vol. 136, pp. 161-62)

With respect to the qualifications required of audit team members, the MRA stated that "all members of the Audit Team, with the exception of those in training status or serving as observers, shall have completed the Audit Training Module" (Exhibit 1034, p. 1-3). In the Air Ontario audit, however, Mr Dyck testified it had not been practicable to comply with the MRA. He said that members of a national audit committee meeting had resolved "that we would try to at least have team leaders have the training, as compared to the members, because insufficient training had been accomplished to this point and it would have been an impractical policy to say that everybody had to have that training" (Transcript, vol. 136, p. 164).

Postponement of the Operations Audit, February 1988

In preparation for the audit due to begin on February 22, 1988, Mr Dyck, the audit manager, and Mr Ingall, the operations team leader, were

briefed by Ontario Region on January 11, 1988, about Air Ontario's operations and maintenance (Mr Sanders, the airworthiness team leader, was absent). Then, on January 26, 1988, Mr Dyck and Mr Sanders (Mr Ingall was absent) met with Air Ontario executives to notify them formally of the upcoming audit and to apprise them generally of the audit process.

The audit teams assembled and commenced their audits as scheduled on February 22, 1988, but the operations portion was soon suspended. The merged entity, Air Ontario Inc., did not have an approved flight operations manual in place, and for this reason it was decided that it would be fruitless to conduct the audit at that time. Accordingly, the operations portion of the audit was postponed until June 15, 1988; however, the airworthiness, passenger safety, and dangerous goods portions of the audit continued as scheduled. As it turned out, the operations audit was finally conducted between October 18 and November 4, 1988, five months before the Air Ontario F-28 crash at Dryden. Ironically, the operations audit did not cover the problem-plagued Air Ontario F-28 program.

Air Ontario's Unapproved Flight Operations Manual

At the January 11, 1988, briefing from Ontario Region, the point was raised that Air Ontario's Flight Operations Manual (FOM) was not yet approved. This FOM represented the operating procedures of Air Ontario Inc., and was intended to replace the manuals that had been in use at Austin Airways and Air Ontario Ltd. An operations audit team relies on a Transport Canada-approved FOM as one of the principal standards against which it measures compliance. The minutes of the January 11, 1988, meeting state that "Bruce Ingall indicated some concern that Transport Canada may be conducting an audit without allowing the operator sufficient time to work with the new operations manual. Henry Dyck will determine the status of the operations manual as it relates to this audit" (Exhibit 1070).

Even though this warning regarding the lack of an approved FOM was raised six weeks in advance of the audit, it went unheeded by Transport Canada. Furthermore, this was not the first mention of the FOM's unapproved status. In October 1987, before the planned audit became a national audit, Mr Donald Sinclair, in a memo announcing the delay in the date of the audit, stated: "This will allow [the] carrier time to implement procedures etc. contained in the new maintenance control and operations manuals now being approved" (Exhibit 1060).

That it took as long as it did – five-and-a-half months – for Transport Canada to approve the FOM is symptomatic of the larger issue of insufficient resources to manage the ERR-generated workload. (Air

Ontario submitted its FOM to Transport Canada for approval on September 15, 1987. It was not approved until February 29, 1988.) Considering the effect that this agonizingly slow FOM approval process had on the audit, it is inexcusable that appropriate steps were not taken by Transport Canada between October 1987 and the commencement of the audit to ensure that the Air Ontario FOM was approved and in use.

Air carrier operations, the headquarters branch responsible for the FOM approval, and the audit manager, Mr Dyck, were situated in the same office building. While Mr Dyck is certainly not alone in bearing responsibility for having to postpone the Operations audit, I believe he could and should have insisted that the approval of Air Ontario's FOM be given high priority. It is clear from the minutes of the January 11, 1988, meeting that Mr Dyck was left with the responsibility of ensuring that the FOM was approved. It is also clear that the unapproved status of the manual had been brought to his attention in the audit's earliest planning stages.

Mr Dyck testified that because Air Ontario's operating certificate had already been issued, it was his understanding that all that remained in the FOM approval process was a "minor administrative task" (Transcript, vol. 135, p. 141). More important, from his perspective, was the fact that the company was still in a transitional stage and had not incorporated the procedures contained in the new FOM. Mr Dyck testified that he did not find out the company was still in a post-merger transition until he arrived in London on February 22, 1988, and began the audit, and he ascribed blame to both Air Ontario and Ontario Region for not having previously brought this to his attention:

- A. But the point I'm trying to make, in – as far as the physical act of approving the manual, that could have done, if that's all we are looking at, we could have clarified that issue very quickly.

It wasn't the manual approval that was in question. It was the ability of the company to meet standards of that manual. And as Mr Nyman explained, they were still in transitional stages, so it would have been fruitless to look at a situation that was in the stages of transition.

- Q. And did you attach a lot of weight to what Mr Nyman was saying to you?

A. Yes, I did.

- Q. Well, the merger between Austin and Air Ontario Limited occurred in June of 1987, which was approximately eight months before these discussions in February of 1988.

A. That is correct.

- Q. Do you not think that eight months would be sufficient time for the company to absorb this transition period and be in a state where ... you could conduct a valuable audit?

- A. Sir, I was not party to discussions, meetings concerning the degree and the depth of the transition and the elements of the work that had to go into it.

I assumed that was already in hand with the Ontario regional office and should have been addressed by them because, after all, the Ontario region had already issued the operating certificate for the company during our preparation meeting at Toronto regional office.

We were not informed that the company was in a transition stage or was still transitioning. We were led to believe that it was already done and the company was now operating to the new manual.

(Transcript, vol. 135, pp. 171-73)

Air Ontario must also bear some responsibility for the aborted operations audit. Inexplicably, when the audit team arrived in London on February 22, 1988, Mr Robert Nyman, Air Ontario's director of flight operations, claimed he had not been forewarned of the audit. This is peculiar in light of the fact that the audit team attended at Air Ontario's corporate offices on January 26, 1988, for the express purpose of briefing the company on the upcoming audit. I find it difficult to accept that the director of flight operations would not have been aware of the upcoming audit. However, if that was the case, such an omission strongly detracts from the credibility of the Air Ontario organization at that time and is further evidence of disarray in the company. This state of affairs should have been interpreted by Transport Canada as another reason to proceed with the operations audit of Air Ontario. In his testimony, Mr Dyck expressed his surprise at Air Ontario's unpreparedness:

- A. And at that time, I was informed that the operations part would be redundant to do the audit on that part because the company ... was not finished amalgamating the two elements of Air Ontario and Austin to the new company. They were still in the stages of changeover.

I asked Mr Nyman, at that time, why he didn't tell me, or I wasn't informed of this, because we had been and officially presented our audit plan to the company back in the meeting of January the 26th.

His response to me was that he was not aware – made aware of the fact that we were coming until the previous morning [February 22, 1988], he knew nothing about –

...

- Q. Were you surprised by that?

- A. Completely. I was completely surprised. I didn't know what to think of it at the time.

However, that was not the main issue. The issue was, was the audit feasible to conduct under the circumstances or was it not.

And it was Mr Nyman who pointed out to me that because the company was still in the process of changing over, that to conduct the audit with the new manual would have been redundant.

In other words, you would have looked at a situation that was in a transition rather than a completion state, and the efforts of the audit team members would have been somewhat fruitless at that time.

(Transcript, vol. 135, pp. 167–69)

Mr Dyck went on to testify that the “main factor” in the decision to postpone the audit was Mr Nyman’s representation that it would not be an appropriate time to conduct the audit:

A. The main factor was Mr Nyman’s claim that the transition elements had not been completed. It was the manual – the approval of the manual itself was of little concern to me because the manual could have been approved in a few minutes. As a matter of fact, the person who approved it was there on site.

Q. And who is that?

A. Mr Len Murray.

(Transcript, vol. 135, p. 171)

The audit team should not have permitted themselves to be influenced by Air Ontario in this way. It is probable that a thorough operations audit conducted on Air Ontario at that point would have exposed at least some of the operational deficiencies, merger pains, and safety risks that were subsequently uncovered at the hearings of this Inquiry. It is imperative that the regulator, in the public interest, maintain at all times a healthy suspicion in dealings with air carriers. Mr Dyck agreed with this premise when it was put to him in cross-examination:

Q. Well, let’s face it. You asked Mr Nyman, have you got any problem, is there anything we can help you with while we are here, that’s – and he said no, there are no problems. That’s the process, wasn’t it?

A. Well, it wasn’t only Mr Nyman, it was Mr Ingall as well and Mr Sinclair and Neale MacGregor, all of those people who were part of the decision process, to defer it.

The point was, I said, what can we do while we are here, is there anything we can do constructive.

Q. But the thing is, you were there to determine whether there was any problem or not. I mean, that wasn’t Mr Nyman’s job to tell you about problems. You were there to do an in-depth audit to verify that there were no problems; weren’t you?

A. Correct.

- Q. I mean, if Transport relied upon carriers to tell them when audits need to be done, there would never be any audits, would there?
- A. That's correct.

(Transcript, vol. 137, pp. 75-76)

On February 23, 1988, the day after the operations and airworthiness audit teams commenced their audits at Air Ontario's base in London, the operations team leader, Mr Ingall, advised the audit manager that he felt the operations portion of the audit should be postponed because of the absence of the Flight Operations Manual. A meeting was convened between representatives of the audit teams and Air Ontario to discuss the audit.

When informed that the audit was in jeopardy, Mr Sinclair and Mr Brayman, who were flying a Transport Canada aircraft from Toronto to Windsor at the time, diverted to London for the meeting. After this meeting, the Transport Canada officials – Messrs Dyck, Ingall, Sinclair, Brayman, and MacGregor – got together to discuss the postponement of the audit. Mr Neale MacGregor, acting on behalf of Mr William Slaughter, the convening authority, discussed the matter by telephone with both Mr Dyck and Mr Ingall, and later briefed Mr Slaughter. The convening authority acceded to the recommendations made by the on-site audit team to postpone the operations portion of the audit.

In light of the difficulty in putting together an audit team at a time when inspectors' workloads were at a maximum and resources were scarce, it is inexcusable that planning efforts among Ontario Region, the convening authority, the audit manager, the operations team leader, and the carrier were not coordinated to ensure total readiness for the audit. The valuable time of every operations team member, not to mention the taxpayers' money, was wasted as a result of the postponement of the operations audit of Air Ontario.

The further question that arises is whether the audit could have proceeded without the approved FOM. Would the audit necessarily have been redundant because the company was not yet operating to the revised FOM, or would it have been an ideal time to audit because Air Ontario was in a state of transition? Mr Ingall, the operations team leader, whose view eventually prevailed, favoured a postponement of the audit. Both Mr Brayman and Mr Sinclair, in contrast, felt that the audit could have proceeded as scheduled. As Mr Brayman said in his testimony:

- A. As a matter of fact, his [Mr Ingall's] opinion prevailed. Neither Don [Sinclair] or I felt that that was a good enough reason to postpone the audit, because an audit is nothing more than a snapshot that has taken place on a given period of time.

And since companies are continually in transition, we felt that the fact that the ops manual was in a transitional process wouldn't really affect what the audit team would see. They would just see exactly what the company was doing at that time.
(Transcript, vol. 131, p. 197)

- A. In a company such as Air Ontario, which is undergoing continuous rapid growth, the manuals are in continuous review. There is never a time when you really have settled down. There's always an amendment on its way.

(Transcript, vol. 132, p. 4)

I agree fully with the approach attested to by Mr Brayman, and I am of the view, for the following reasons, that the operations portion of the Air Ontario audit should have proceeded, as scheduled, in February 1988:

- Audits are conducted for the protection of the public and the assistance of the air carrier.
- The functional merger that created Air Ontario Inc. had taken place in June 1987, eight full months prior to the scheduled audit. A transition period of such length raises warning flags and warrants an in-depth inspection of the carrier.
- It is a requirement of law (Air Navigation Order Series VII, No. 2, section 31) that a carrier provide an operations manual for the use and guidance of operations personnel in the execution of their duties. In the approximate eight-month post-merger period, but prior to the approval of the new Air Ontario Inc. Flight Operations Manual, Air Ontario Inc. crews continued to use both the old Austin Airways and Air Ontario Ltd operations manuals. The protracted circumstance of the company's functioning with two flight operations manuals created a potential safety hazard worthy of inspection.
- Even though operations audit teams rely on a Transport Canada-approved flight operations manual as the standard against which to measure compliance, in the absence of the new, approved, and integrated FOM the audit team, composed of experienced air carrier inspectors, could still have conducted an in-depth, effective audit of the company at that time.
- Since the audit team was already assembled and as resources were at a premium, every effort should have been made to conduct the audit, even though some minimal time would have been spent revising the audit plan.
- Separating the airworthiness, passenger safety, and dangerous goods portions of the audit from operations dilutes the effectiveness of the audit as a comprehensive snapshot of a company at a particular time.

A joint audit would have been more effective in that there are overlapping responsibilities among these different audit teams.

Finally, the circumstances surrounding the delayed operations audit again illustrate the existence of an interbranch problem between the Airworthiness and Operations branches. It appears that Mr Dyck's inaction with regard to the Air Ontario audit in the period between January 11, 1988, and the commencement of the audit on February 22, 1988, may have been influenced by his reluctance to prod the Operations Branch for work, such as the delay in the approval of the FOM. Mr Dyck agreed with a proposition put forth by his superior, Mr Roger Beebe, that the failure of the National Audit Programme to produce a quality program was attributable to the fact that the office of primary interest was held by the Operations Branch rather than the Airworthiness Branch. Mr Dyck placed the onus for the audit's downfall squarely on the operations side:

Q. All right. Well, Mr Beebe is pointing to the operations branch as the party who is being blamed, it seems. Would you agree with that?

A. Yes, to a certain degree, yes, I would.

Q. And could you provide the Commissioner with your views on this airworthiness operations discrepancy?

A. Well, using the evidence that we have discussed in the last few days as an example, from the inception of the audit, there is a lot of discussion and to-ing and fro-ing regarding selection of team members.

Then there's also a discussion and changes of audit dates and schedules and trouble obtaining the audit manual. Then there's further trouble in re-scheduling the audit without our involvement. Then we have further trouble in completing the audit report.

It is that type of scenario that we are talking about in general terms as being a difference between the way the operations branch operates and the way we, in airworthiness, operate.

(Transcript, vol. 136, p. 106)

The apparent ability of the Airworthiness Branch to complete audits more promptly than the Operations Branch appears, at least in part, to be due to the differences in work priorities between the two branches. In fairness to operations inspectors, pilot proficiency checks (PPCs) are deemed non-discretionary work items while audits are discretionary. As such, operations personnel, to the chagrin of their airworthiness colleagues, have often been delinquent in completing their audit responsibilities because they have had check rides to conduct that took

priority. Mr Dyck testified that he encountered that very problem in attempting to complete the final report of the Air Ontario audit:

- A. Well, again, in my experience with trying to complete the operations portion of the audit and trying to deal with Mr Murray, one of Mr Murray's other priorities was flying, for various reasons.

And this other priority, of course, interfered with the completion of the audit report. That is basically, I believe, what he is talking about here.

(Transcript, vol. 136, p. 109)

Conflicts between different factions exist in most if not all industries and workplaces, and the airworthiness-operations conflict might be seen as an overblown, petty rivalry. Petty or not, however, such conflicts may compromise the safety of the travelling public, as the cancellation of the Air Ontario operations audit illustrates. Nevertheless, the onus must rest with Transport Canada management to establish policies that neither conflict with one another, such as leaving discretionary work (e.g., audits) unfinished because of a non-discretionary obligation (e.g., pilot proficiency checks), nor cause conflict among the line personnel who implement the policy.

Approval of the Flight Operations Manual

Air Ontario's FOM received Transport Canada approval on February 29, 1988, a mere one week after the postponement of the operations audit. There can be little doubt that the haste with which the approval ultimately arrived was a direct result of the postponement of this audit. This view was confirmed by Mr Leonard Murray, who, on his return to Ottawa from London after the aborted audit, was assigned to finalize the FOM's approval:

- Q. And how long did it take for the manual to get its approval from the time you were dispatched into the assignment of having a look at it and providing an opinion on its – whether or not it should be approved?

- A. I can't give you exact – it wasn't very long. I can't, you know, it was maybe a day, two days.

- Q. All right. So you came back from the audit of Air Ontario on the 23rd of February, and by the 29th of February, the manual had been approved; is that right?

- A. That's correct.

...

- Q. As far as you are aware, did the cancellation of the audit at Air Ontario have anything to do with the approval of this manual within one week?

- A. Yes.
- Q. And could you elaborate upon that? What is your understanding of the connection between the two?
- A. I'd say it speeded it up.
- Q. After this memorandum of February 29th, 1988, that being Exhibit 1038, was it your understanding that you would be involved with the Air Ontario operations audit when it resumed?
- A. I had a feeling that I would probably be asked to do the Convair work again on the next audit.

(Transcript, vol. 133, pp. 96-98)

Air Ontario submitted the Flight Operations Manual to Transport Canada for approval on or about September 15, 1987. As such, it took Transport Canada close to six months to approve and return the FOM. Despite the compelling evidence before this Commission of excessive workloads in the Air Carrier Branch as a result of deregulation, that alone is not a sufficient reason for failing to approve a crucial document such as the FOM in a more timely fashion.

The February 1988 Audit

Airworthiness Audit

In contrast to the operations portion of the audit, the airworthiness audit, under the guidance of airworthiness team leader Mr Peter Sanders, was planned and executed smoothly. This was also the case for the passenger safety and dangerous goods audits conducted by Ms Jacqueline Brederlow and Mr Paul Saulnier, respectively. A post-audit meeting was held on March 24, 1988, at which time the draft airworthiness, passenger safety, and dangerous goods portions of the audit report were presented to Air Ontario officials. Subsequently, the final versions of these portions of the audit report were sent to Air Ontario under a covering letter from Mr Dyck to Mr Douglas Christian, Air Ontario's chief inspector, on or about April 15, 1988. (This date is Mr Dyck's best recollection, since the covering letter was left undated.) The punctuality of the airworthiness, passenger safety, and dangerous goods inspectors in compiling their reports is in stark contrast to the five-month period taken by the operations team to complete its report.

The specific airworthiness audit findings did not reveal significant transgressions in Air Ontario's maintenance organization. It should be noted that the Air Ontario F-28 program was not audited, since the first F-28 was not acquired until May 1988. In general, Mr Dyck was satisfied with the conduct and results of the airworthiness audit, and described

the findings and non-conformances as “typical ... for a company of that size” (Transcript, vol. 136, p. 17).

Passenger Safety Audit

The passenger safety portion of the audit was conducted from February 29, 1988, to March 4, 1988, by Ontario Region’s superintendent of passenger safety, Ms Jacqueline Brederlow, with the assistance of Inspector Jennifer Johnstone.

Passenger safety inspectors are responsible for inspecting and approving all matters pertinent to interior cabin safety. Transport Canada’s Ontario Region is structured in such a way that the passenger safety division reports to the regional manager, air carrier operations. For this reason, and because their responsibilities overlap, the operations and passenger safety audits were originally scheduled to coincide. However, because Ms Brederlow had prior commitments at a passenger safety training course, she did not arrive in London for the audit until February 29, 1988, by which time the operations audit had already been postponed and the operations audit team had disbanded. On the decision of the audit manager, the passenger safety audit went ahead as planned.

In light of the circumstances of the postponed operations audit, and the problems in coordinating busy schedules, it is difficult to fault the decision to proceed with the passenger safety audit in February-March 1988. However, the fact that Ms Brederlow found herself conducting an audit without the support of the operations team is yet another consequence of the poor planning and resultant cancellation of the operations audit.

Although little evidence was presented on the findings of the passenger safety audit, one example did come to light of an inconsistency between operations and passenger safety that could have been prevented with effective communications between the two groups. A document used by Ms Brederlow in her inspection, entitled Audit Checklist for Air Ontario Inc. National Audit 29 Feb – 4 Mar 1988, illustrates the importance of uniform procedures for the flight and cabin crews. The checklist included the following questions:

Is the Cabin Attendant Manual procedurally consistent with the Operations Manual, Passenger Agent Manual, Aircraft Operating Manuals? Are Emergency Procedures and signals the same for cabin attendants and pilots?

(Exhibit 1077)

Beside this question, Ms Brederlow had handwritten the response, “Yes. Based on draft Ops [Flight Operations] Manual.”

The clear intention of the above-noted question is to ensure that the manuals guiding the operations of flight crews and cabin crews in a given situation are consistent. However, a comparison of Air Ontario's Flight Attendant Manual (Exhibit 137) and the Flight Operations Manual (FOM) (Exhibit 146) reveals an omission and/or inconsistency in the crucial area of hot refuelling. The Flight Attendant Manual sets out the following: "When refuelling is required with one engine running, all passengers are to be off-loaded and cleared from the area during the refuelling period. Flight Attendants should also leave the aircraft" (section 2.31, paragraph 12). The FOM, in contrast, is silent on this point.

Had the passenger safety and operations audits been conducted at the same time, it is possible that this variance would have been uncovered. Had this omission in the FOM regarding hot-refuelling procedures been exposed at the audit process and become the subject of review at Air Ontario, it is possible that the crew of flight 1363 would have been better equipped to respond to the hot-refuelling situation when it occurred on March 10, 1989. (Hot refuelling is discussed in chapter 21.)

Dangerous Goods Audit

The dangerous goods portion of the audit was conducted by Mr Paul Saulnier, regional superintendent dangerous goods, Atlantic Region. On March 11, 1988, upon completion of his audit, Mr Saulnier submitted his vertical analysis sheets² along with a dangerous goods overview to the audit manager. The dangerous goods overview included the following points:

- This audit seemed to be untimely considering the amalgamation of the two previous companies and the absence of an approved company flight operations manual.
- Considering the size of this company, it would be a definite advantage to all concerned for the company to appoint a dangerous goods coordinator.

² Vertical analysis is a reporting format whereby each audit finding is recorded on a separate form. Each form identifies a problem, provides examples and probable causes, and recommends corrective action. There are two types of findings and consequently two types of forms:

i) Non-conformance findings apply where legislative requirements or authorities delegated to the company have not been followed. They require a written response from the audited company and subsequent follow-up from Transport Canada.

ii) Observations are made where existing standards, practices, or techniques can be improved, but where such items do not relate directly to a requirement. The audited company may, but is not required to, respond to observations.

- The company must establish system-wide procedures to unify the present Air Ontario Inc. program.

(Based on Exhibit 1076)

Mr Dyck testified that he took no action on receipt of Mr Saulnier's dangerous goods overview:

Q. All right. And upon receipt of ... this summary, this overview from Mr Saulnier, what did you do with these remarks?

...

Did you pass these comments on to the company?

A. No, sir. I passed them on – his findings as they were spelled out in the company operations manual – or, pardon me, the vertical analysis sheets that he provided to me.

Q. All right, but not as stated in this overview?

A. No. I may add that since these are his personal views, that where there are findings, then they should have been substantiated in the vertical analysis forms.

And I may have used them – again, without looking at the report in any detail, they may have been included in the summary at some point.

In other words, if you look in the report, you will see summaries for different areas. And they may have been, I don't know. I would have to do some research to answer that question.

(Transcript, vol. 136, pp. 4-6)

I believe the substance of Mr Saulnier's recommendations is important and merited further action from Mr Dyck. Bearing in mind Mr Saulnier's unique expertise as a regional superintendent of dangerous goods, it would have been potentially beneficial to forward his comments to Air Ontario, even though they may not have fit within the vertical analysis format required for the report. If the time and money required to send experienced inspectors to conduct audits are being expended, then certainly the inspectors should not be discouraged from making observations or recommendations that may be of potential benefit to the carrier and the travelling public. The alternative is to check the company's conformance with standards, specifications, or regulations and to report only the non-conformances. While this approach more clearly delineates the inspector's duties and responsibilities, it runs the risk of engendering a "checklist mentality" in the inspectors.

The Operations Audit

Rescheduling and Restaffing the Operations Audit

What had initially been a 90-day postponement of the Air Ontario audit eventually stretched to eight months, and the operations audit team did not reconvene in London until October 18, 1988. The process of rescheduling and restaffing the audit, particularly the position of operations team leader, since Mr Ingall was not available to serve on the rescheduled audit, proved the major stumbling block.

Mr Slaughter announced in a memorandum dated July 21, 1988, that Mr W.A. (Bill) McKenzie, a small air carrier inspector, had been appointed as the new audit team leader for the audit of Air Ontario scheduled for October 18 – November 4, 1988. However, Mr McKenzie's appointment was short lived. He immediately wrote back that he was not qualified or endorsed on any of the aircraft in Air Ontario's fleet (except the DC-3) and would therefore not be an appropriate choice. Surely Mr McKenzie's qualifications should have been ascertained before his appointment.

As a result, on August 23, 1988, Mr Slaughter replaced Mr McKenzie with Mr Jack Rozon as the operations team leader. Mr Dyck, who was not involved in the selection process, was advised of Mr Rozon's appointment in a memorandum from Mr Slaughter:

Because of circumstances beyond our control, W.A. (Bill) McKenzie's designation as Operations Team leader has to be withdrawn. Mr Jack Rozon of AARCBA [Large Air Carrier Operations – Headquarters] has been nominated in his stead and will be accompanied by Mr Len Murray of the same section who will profit from the opportunity to obtain on the job training.

(Exhibit 1039)

As events unfolded, the passing reference that Mr Murray would "profit from the opportunity to obtain on the job training" became more significant, if not ironic. On or about October 5, 1988, less than two weeks before the starting date of the operations audit, Mr Murray, who had never been involved in an audit, was advised that he would be replacing Mr Rozon as operations team leader. Mr Murray related the events as follows:

- Q. And the expression, "profit from opportunity to obtain on-the-job training," as written by Mr Slaughter, what was meant by that?

- A. I had never done an audit before, and that was the intent of it was to give me some on-the-job training.
- Q. I see. So after August 23, it's a matter of record that now that you were a part of the audit team assisting or accompanying Mr Rozon. What was the next involvement you had with the Air Ontario audit, which would eventually occur in October, November of '88?
- A. I can't remember the exact dates. It was around maybe the 5th or 6th of October, '88.
- Q. The 5th or the 6th of October, 1988, what happened?
- A. I was advised that Jack Rozon would be taking the A310 course in Toulouse.
- Q. In Toulouse, France?
- A. France.
- Q. Yes.
- A. And that they wanted me to do the audit as team leader.
- Q. And who advised you of this?
- A. Mr Gilchrist advised me first.
- Q. And what was your response when you heard that they wanted you to be the audit team leader?
- A. I did not want to do it.
- Q. Why didn't you want to do it?
- A. I had no experience in previous audits.

(Transcript, vol. 133, pp. 103-105)

Undoubtedly Mr Rozon's announcement of his unavailability a mere two weeks before the scheduled start of the audit was especially disruptive since he was the third team leader to step aside. The subsequent appointment of a reluctant, inexperienced Mr Murray was a "desperate act" to prevent having to postpone the audit yet again. Not only did Mr Murray not have prior experience as a team leader, he had never before participated on an audit in any capacity. (He was to have been a team member on the postponed audit in February 1988.) He had, however, taken Transport Canada's one-week audit training course in April 1988.

Amazingly, the convening authority, Mr Slaughter, had elevated Mr Murray's position from one where he would "profit from the opportunity to obtain on-the-job training" to team leader. Mr Slaughter admitted he appointed Mr Murray because "he was the only one left":

- Q. Len Murray, on the other hand, who also wasn't qualified –
- ...
- unfortunately didn't have the luxury of being able to turn this down?
- A. That's right.
- Q. Why not?

- A. Because by then, I was becoming rather impatient. It was suggested that I postpone the audit again from the October period, and my patience by this time, when I was starting to get a grasp of what was happening, wore a little thin and I recognized that anyone – or at least I assumed, based on the information I gathered, that an air carrier inspector with the guidelines that were presented should be able to perform the audit – or the team leader function without too much difficulty.

And just to assist him, I ensured that, to the chagrin of the Atlantic region, a chap by the name of Roy Wilson was attached to the team, albeit for an abbreviated period of time, but Roy had been one of the founders of the audit procedures program and training package, so that I wanted him there to assist Len Murray and brief him and get him started and directed.

And then I thought that under the circumstances, he would be able to handle it himself.

- Q. To cut through all the words that you have just used, what is the reason that Len Murray finally got the nod?
- A. He was the only one left.

(Transcript, vol. 144, pp. 41–42)

Surely the Canadian public and Canadian air carriers are entitled to expect more.

Mr Slaughter further explained that Mr Roy Wilson, an air carrier inspector from Atlantic Region who did have significant audit experience, was not made team leader because he would not have been available for the duration of the audit. Mr Slaughter was anxious to have the audit completed and he was frustrated by the long delay, as well as the difficulties in securing a team leader. Nevertheless, I find his decision to appoint as operations team leader a person who had never before participated on an audit an error in judgement. Although Mr Murray voiced his reluctance to be team leader because of inexperience and even suggested that the audit be further postponed, his concerns were rejected by his superiors. The following excerpt from Mr Murray's testimony illustrates his reluctance to be team leader:

- Q. And what did Mr MacGregor tell you?
- A. He said there was nobody else left to do the Canadian audit, all the other inspectors were busy, and that I was the only one left, and had the audit course and he thought I could do it.
- Q. And what was your reaction to that?
- A. I told him I did not want to do it.
- Q. And why did you tell Mr MacGregor you didn't want to do it?
- A. As I said before, I didn't want to do it because I didn't have any experience in doing audits.
- Q. And what was ... Mr MacGregor's response to that concern?

- A. Well, I – before his response, I did ask if there could be a postponement to a later date and they could – when the Canadian audit got completed, then they could pick somebody for a team leader had come off the Canadian audit with experience.
- Q. And what was his response to that suggestion?
- A. He said that there was no postponements, that the director had stated he wanted it done now.
- Q. And who was the director?
- A. Bill Slaughter.
- Q. So Bill Slaughter said no more postponements, the audit had to be done now. MacGregor passed that message along to you and you were it; is that right?
- A. That's correct.
- Q. And how did you feel about that?
- A. I didn't feel too good about it, but I worked for Transport Canada.

(Transcript, vol. 133, pp. 105–106)

To his chagrin, Mr Dyck, the audit manager, was not involved in the rescheduling or restaffing of the operations audit. In fact, Mr Dyck was not consulted or even advised when the date of the audit was again delayed from July 1, 1988, to October 18, 1988. (Initially the audit was postponed from February 1988 until June 15, 1988, and then until July 1, 1988.) Mr Dyck's dissatisfaction was apparent in a letter he wrote to Ontario Region's director of aviation regulation, Mr Ronald Armstrong, on September 8, 1988:

During the initial company debriefing and my meeting with you, and in our letter to the company we had agreed on a tentative date for July 1, 1988 to complete the operations portion of the audit. Subsequently the audit dates were changed without my knowledge, agreement or notice to the company. To preclude any further misunderstanding, can you confirm at your earliest convenience if there are any matters or issues that may interfere with the operations portion of the audit, as scheduled.

(Exhibit 1086)

That the audit manager was excluded from the replanning of the audit is another example of poor communication in the administration of the audit. At the time that Mr Dyck wrote to Mr Armstrong, Mr Rozon was still the scheduled team leader. Nevertheless, when Mr Rozon stepped down, Mr Dyck was not involved in the appointment of his replacement, Mr Murray. However, in that he had previously received a letter from Bill Slaughter stating that Mr Murray will "profit from the opportunity to obtain on-the-job training," Mr Dyck was aware that Mr Murray lacked audit experience. Furthermore, it appears from Mr Dyck's

comments that the root of the problem once again stemmed from friction between the audit manager and the Operations Branch:

Q. Did you feel that as the audit manager, you should be involved in the setting of dates and arrangements and so forth for the audit?

A. Of course I should have been ... I specifically discussed the matter with the company on the very date that the initial part of the audit was cancelled. Not, pardon me, cancelled, deferred. And I specifically rescheduled it simply to avoid further embarrassment.

And it was my understanding that that was an agreement, a commitment. That communication was undertaken by people, not by myself, and agreements were made without my consultation or knowledge, and the dates were changed.

Q. Would it be fair to infer that you were frustrated and upset with Ontario region, how they were handling it?

A. I was frustrated and upset with all of the operations side of the house, it wasn't just the Ontario region. It was a combination of the operator, the Ontario region and management on the operations side, that somebody had made this agreement and I was not informed about it.

(Transcript, vol. 136, pp. 29-30)

Despite the difficulties experienced in staffing the operations audit in February 1988 and the fact that eight months were available to line up personnel for the October 1988 audit, staffing was still not attended to until the two weeks preceding the audit. The consequence of this poor management is that no F-28-qualified inspector was available at such short notice and the F-28 was not audited. Obviously, it would be far more difficult for an air carrier inspector to free up his or her heavily booked schedule for two weeks, on only two weeks' notice, than it would be on eight months' notice. It is no excuse to point to the unusual turnover of team leaders, and to claim that had there not been problems in the appointments of Mr McKenzie and Mr Rozon, a competent, qualified audit team would have been in place. Organization and competency starts at the top. In this instance, the convening authority and the audit manager, and their staffs, should have used their combined clout to assert the priority of the National Audit Programme and should have taken measures to ensure that the embarrassment of the February audit was not repeated.

Instead, the task of arranging for operation team members eventually fell to the team leader. Mr Murray, who had never before worked on an audit nor staffed an audit team, was saddled with the "beg, borrow and steal" task of staffing the audit on only two weeks' notice. Mr Dyck played no part in the selection of team members, nor did he have any

knowledge of their audit experience or even if they had taken the audit training course.

Mr Murray tried to secure Mr William MacIntyre, a qualified F-28 inspector, for the F-28 segment of Air Ontario's operations audit, but was told Mr MacIntyre was otherwise occupied doing check rides. Thereafter, as his testimony indicates, Mr Murray became frustrated and his attempts to secure a qualified F-28 air carrier inspector (ACI) ceased:

- Q. Did you elicit the assistance of Mr MacGregor to secure Mr MacIntyre as an F-28 trained ACI?
- A. No, I was getting frustrated at that time. I did phone – I needed somebody badly to do the small – on the sub-bases of their northern operation, and I made a phone call to Don Sinclair in Toronto and he said the only one he could spare, again that would be on a limited days, possibly maybe only two days, would be – he could complete most of the audit but maybe minus a couple of days, he would be unable to attend.
- Q. And who was that? Who would be available?
- A. Gord Hill.
- Q. So after speaking with Don Sinclair, you were able to get Gord Hill to deal with small aircraft in the sub-bases in the north?
- A. That's correct.
- Q. Did you seek the assistance of Mr MacIntyre again to secure an F-28 trained person?
- A. No, I didn't.
- Q. Did you look anywhere else to see if there were F-28 trained people available?
- A. No, I did not, at that particular time, I didn't.

(Transcript, vol. 133, pp. 110–11)

On October 5, 1988, two weeks prior to the start of the operations audit, Mr Dyck wrote to Mr Donald Sinclair, Ontario Region's manager of air carrier operations, to arrange a pre-audit briefing meeting. Ontario Region, as the branch principally responsible for inspecting Air Ontario Inc. (and its predecessors Austin Airways and Air Ontario Limited), should have been well placed to brief the audit team on the rash of changes that the company had recently implemented. Mr Dyck provided Mr Sinclair with a list of ten items required for the meeting, including previous audit reports. It is important for audit teams to review previous audit reports to ensure that former non-conformances have been rectified and that old transgressions are not being repeated. On October 12, 1988, when Mr Dyck and Mr Murray met with Mr William Brooks, principal inspector of Air Ontario in Ontario Region, they were frustrated to find that some of the requested information, most notably the previous audit reports of Austin Airways, were not available. (The previous Air Ontario Limited audit reports were made available.)

Even though Mr Dyck's letter provided adequate advance notice of the meeting (two weeks), the requested material was not made available. I find that Ontario Region was unsupportive of the audit team in this regard.

Failure to Inspect the F-28

If there was a silver lining to the postponement of the audit, it was that it provided Transport Canada with the opportunity to inspect Air Ontario's F-28 program. Air Ontario introduced the F-28, its first jet aircraft, into service in June 1988, close to four months after the audit was originally to have been conducted. However, the F-28 was not included in the audit of October 1988 and the opportunity was missed.

The evidence is clear that the operations audit team did intend to include the F-28 operation in the October 1988 audit. Mr Dyck prepared an audit plan and circulated it to the operations team members on October 7, 1988. Attached as part of the audit plan was a listing of the "Operations Audit Areas" (Exhibit 1040) prepared by Mr Murray, in which the F-28 was included along with Air Ontario's other aircraft types as aircraft to be audited. Moreover, the F-28 was listed as the responsibility of both Mr Murray (who was also responsible for the Convair 580) and Mr Edward Mitchell (who was also responsible for the HS-748).

Nevertheless, in light of the fact that there were no F-28 qualified inspectors on the audit team, the F-28 was relegated to a low-priority, "time-permitting" item. As Mr Murray said in his testimony:

Q. Perhaps you can clarify that for me. Were you or were you not going to review the F-28 program in the areas listed?

A. As I said before, we had nobody that was current on the F-28 and I do not like doing an aircraft that you are not current on.

So my plan was, if time permitting in the air, we would complete a line check, either myself or Ted Mitchell, on the F-28.

Q. Now, certainly it would have been preferable to have an F-28 trained person to assist, but the fact of the matter is you didn't, and the F-28 was one of the aircraft in the Air Ontario fleet.

Again, wasn't it your intention to review the F-28 in a manner as you would the Convair 580 or the HS-748?

A. We reviewed the main part, you know, of the pilots that were flying, we reviewed all the part that the pilots flying the F-28.

Q. When you say – you reviewed what?

A. Well, it would be the flight crew records –

Q. So –

A. – which would cover all their training and where they had their course and their pilot proficiency checks on type.

Q. But you didn't do flight inspections; did you?

A. No.

(Transcript, vol. 133, pp. 132-33)

Although Mr Murray was not adequately supported by the audit manager and the convening authority in assembling an audit team, he exacerbated his difficulties by not requesting their assistance. For example, in the last few days of the audit he unilaterally decided not to audit the F-28. He stated that his decision was due partially to the fact that Mr Mitchell, who along with Mr Murray had been assigned to audit the F-28 program, had been called away from the audit to conduct pilot proficiency checks in Toronto for Air Canada. That Mr Mitchell was permitted to leave the unfinished audit to conduct simulator rides further demonstrates the audit's low priority with the audit management. Also, Mr Murray testified that he did not have prior notice that Mr Mitchell would be making an early departure. According to Mr Ian Umbach, superintendent of air carrier operations, Mr Mitchell's early departure from the Air Ontario audit was not an isolated incident. Mr Umbach testified that air carrier inspectors would quite often have to leave in the midst of an audit to do other tasks. He cited as an example the 1988 audit of Canadian Airlines International, at which time inspectors were conducting the audit through the day and doing pilot proficiency checks in the simulator during the night. Mr Umbach added that this undesirable, double-workload situation was one of the factors that inspired his memorandum of December 1, 1988, calling for a moratorium on national audits "due to lack of resources, and an overwhelming workload" (Exhibit 1105). (See chapter 30, *Effects of Deregulation and Downsizing on Aviation Safety*.)

Mr Murray also indicated that his decision not to audit the F-28 was influenced by his understanding that Ontario Region would be conducting surveillance of Air Ontario's F-28 program. However, this rationale conflicts with the following view expressed by Mr Donald Sinclair, Ontario Region's manager of air carrier operations and the person who had called for the audit in the first place, who had expected that the F-28 was being audited:

- Q. Did you, sir, have any concerns from your position that there were no qualified F-28 persons assigned to the audit being done at Air Ontario?
- A. I wasn't aware there wasn't an F-28 person involved.
- Q. Would you have assumed that there was?
- A. Yes, I would.
- Q. That would not be an illogical assumption?
- A. No.
- Q. Were you surprised that there wasn't?
- A. I'm surprised now to learn there wasn't.

Q. You didn't know?

A. No. The fact there weren't any non-conformances on the F-28 would not indicate that it wasn't examined by a qualified person.

...

Q. Mr Sinclair, from your perspective, do you think that a complete and satisfactory audit can be completed with no one on a team being qualified on one of the aircraft types being audited?

A. Not if it's a large aircraft, no, it's not complete.

(Transcript, vol. 142, pp. 77-78)

Either way, this again demonstrates a striking lack of communication and coordination between Ontario Region and the audit team.

Mr Murray made an error in judgement in not consulting with the audit manager at that time and in not maintaining communication with the audit manager, as set out in the audit handbook. Had Mr Murray advised Mr Dyck or Mr Umbach (Mr Murray's superior at headquarters) that he had not been able to recruit an F-28 qualified inspector, they may have seized on the importance of inspecting the new jet aircraft and used their rank to assist in obtaining qualified personnel. Similarly, Mr Murray should have reported during the course of the audit that he had not audited the F-28.

Mr Dyck confirmed in his testimony that it was his expectation that the F-28 would be audited, but that he did not know, nor had he enquired, if Mr Murray and/or Mr Mitchell were F-28 qualified. In fact, Mr Dyck testified that he only became aware that the F-28 had not been audited sometime after the audit report had been issued. (The audit report was sent to Air Ontario on April 3, 1989.)

Just as Mr Murray bears responsibility for not passing on information of this omission to his audit manager, Mr Dyck is similarly responsible for not having taken steps independently to assure himself that the F-28 operation was being inspected. Two days after the audit commenced, Mr Dyck returned from Air Ontario's base in London to his office in Ottawa, where, as the following testimony indicates, he remained for the two-week duration of the audit:

Q. All right, and did you know if the F-28 was being audited by the team members?

A. No. I did not. I assumed it was part of the overall audit. They would have done what the company was looking or operating at that time.

Q. Did you have any discussions at all during the course of the audit with Mr Murray, Mr Mitchell, any other team members, as to whether or not the F-28 was being inspected?

A. No, as I told you earlier, I was not on site until the completion of the audit, and when the inspectors returned back to London

after they had done their series of in-flight inspections and finished doing their on-site inspections.

And no, there was no conversation specifically that I can recall about the F-28 operation itself, no.

- Q. Did you do anything during the course of the audit to satisfy yourself that items that had been ... in the audit plan were, in fact, being inspected?
- A. Well, as I said, I was in Ottawa while the audit was being carried out. On site, I had little or no value there. I trusted the ops team leader would, in detail, look at the area, his area of responsibility. That's perhaps the best answer I can give you.

(Transcript, vol. 136, pp. 47-48)

Mr Dyck decided that his time would be more valuably spent attending to pressing certification tasks in Ottawa. Moreover, in that he was an airworthiness and not an operations professional, Mr Dyck felt that his utility on the audit site was limited. This is only partially true. While he may not have been able to assist on technical inspection matters, he would have been in a position, as set out in the audit handbook, to "exercise line authority over assigned audit staff" and "maintain ongoing communication with senior management of the company" (Exhibit 1033). Mr Dyck's approach contrasts directly with that of Mr Umbach, himself a former audit manager on an audit of Worldways. Mr Umbach described an audit manager's responsibilities as follows: "I feel he must be there throughout the duration of the audit to handle the day-to-day problems and questions that will naturally arise from an audit" (Transcript, vol. 139, p. 147).

Instead, Mr Dyck stated that he trusted that the operations team would look at their area of responsibility in the same independent, problem-free manner that the airworthiness and dangerous goods audit teams had. In this respect Mr Dyck erred. As a novice team leader, and distinguishable from the airworthiness and dangerous goods team leaders in that respect, Mr Murray sorely needed Mr Dyck's support and experience. Since Mr Dyck and Mr Slaughter were fully aware of Mr Murray's inexperience, they had a responsibility to monitor him closely. To this extent, it mattered little that Mr Dyck was not an operations expert. By being on site he, as audit manager, would have been in a position to ensure that the audit team inspected the F-28 operations. Also, as a committee member on the Regulatory Reform/Aviation Safety Working Group, Mr Dyck had direct experience with respect to what inspectors should be aware of in recently merged companies ("Aviation Safety in a Changing Environment," Exhibit 1057). He had developed a "Merger Procedures Guide" to be used by airworthiness inspectors and

he was familiar with a similar guide for air carrier inspectors (Exhibits 1055 and 1056). These guides were not used by the auditors of Air Ontario.

Finally, it appears that the circumstances surrounding the October 1988 operations audit of Air Ontario, such as the postponements and staffing problem, served to create an environment where completing the audit took precedence over the quality and comprehensiveness of the inspection. I do not believe that this was caused by a general lack of professionalism or competence in the audit personnel but by the system itself. Rather than having dedicated audit personnel in place to fulfil the important audit function, the National Audit Programme operated by creating a second job (the audit) for inspectors who were already overburdened with their principal jobs. In the circumstances outlined above, it is small wonder that the priority and comprehensiveness of the audit suffered.

Mr Murray testified that the "heart of an audit in an operation, is the flight crew training records" (Transcript, vol. 133, p. 38) and that the training records are, in relative terms, more important than in-flight inspections or system operations control (SOC) inspections, which are usually conducted in the course of the audit. Both Mr Slaughter in his testimony (Transcript, vol. 144, p. 28) and Dr Robert Helmreich, who provided expert testimony to the Commission regarding the human performance aspects of the Dryden accident, disagreed with Mr Murray's characterization. Although audits provide a valuable opportunity to ensure that a company's training records and other paperwork are in order, the importance of the paperwork should not be overemphasized. In the audit of Air Ontario, Mr Murray testified that flight crew training records of F-28 pilots had been reviewed but that no flight inspections had been conducted. A review of the F-28 pilots' training records does not provide an audit team with any significant insight into the F-28 operation. Dr Helmreich's comment most aptly describes this point:

The statement that examination of crew training records forms the heart of the audit certainly reflects an honest opinion. However, from the author's research experience, an alternative view can be proposed that the observable behaviour of crews in line operations is the key to understanding the level of safety and effectiveness in flight operations.

(Exhibit 1270, Human Factors Aspects of the Air Ontario Crash at Dryden, Ontario: Analysis and Recommendations to the Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario. See technical appendix 7.)

Had the F-28 been audited by a professional air carrier inspector, even one without F-28 qualifications, it is reasonable to assume that a number of Air Ontario's questionable practices relating to the F-28 operation would have been uncovered. According to the Operations Audit Areas list, which formed part of the audit plan, Mr Murray had planned to inspect twelve facets of Air Ontario's operation. It should be noted that the Operations Audit Areas list was derived from the Audit Procedures Handbook, and that the Manual of Regulatory Audits provides audit checklists for use by inspectors "to ensure all aspects of requirements have been audited" (Exhibit 1034, p. 4-1).

However, a retrospective look at the work of the operations audit team revealed that a number of key areas of Air Ontario's operations, although set out in the audit plan and handbook, were not audited. The following enumeration of the intended operations audit areas is adapted from Exhibit 1040; a comment follows each point, F-28 specific where appropriate, on whether the area was covered in the audit:

1 Previous Transport Canada audit

- The previous audit reports of Air Ontario Ltd were provided to and reviewed by Mr Murray. However, Ontario Region did not have the previous Austin Airways audit reports available for review.

2 Operating certificate (OC) and operating specifications (ops specs)

- Mr Murray testified that the OC and ops specs were inspected.

3 Manuals

- The F-28 Operations Manual was not reviewed by the audit team because, as Mr Murray testified, he was informed "verbally by other inspectors" that Air Ontario was operating with an FAA-approved Piedmont Operations Manual, which had been approved by Ontario Region (Transcript, vol. 133, p. 134). In fact, the approval granted by Transport Canada to Air Ontario on February 15, 1988 (Exhibit 857), enabled Air Ontario to use the Piedmont Airlines F-28 training syllabus, simulator, and instructors as an interim measure while transitioning to the F-28. However, Transport Canada's authorization did not explicitly extend to Air Ontario's use of the Piedmont manual as its F-28 operations manual.
- Had the audit team investigated the situation surrounding the Piedmont F-28 Operations Manual themselves, they would have been in a position to observe and report on the problems with the manuals (see chapter 19, F-28 Program: Flight Operations Manuals).

- Mr Murray admitted in his evidence that a typical check of the Piedmont Operations Manual used by Air Ontario's F-28 crews would have disclosed the absence of an amendment service.
 - Similarly, had the audit team inspected the manuals, they undoubtedly would have discovered that some Air Ontario F-28 pilots were using USAir manuals while others used Piedmont manuals, and that the company still had not prepared its own F-28 operations manual.
 - The Air Ontario Flight Operations Manual was inspected.
- 4 Training program and company check pilot (CCP)
- The F-28 training program syllabus and CCP information were inspected solely to the extent possible by reviewing the pilot records. The CCPs were not interviewed or monitored.
- 5 Flight crew training records
- F-28 flight crews' training records were reviewed.
- 6 Simulator evaluation
- No action had been taken to establish that the F-28 simulator had been evaluated in accordance with Air Navigation Orders Series VII, No. 2.
- 7 Dispatch and flight watch
- Inspector Jerry Frewen, an air carrier navigation specialist, was the auditor responsible to inspect Air Ontario's dispatch and flight watch operation. Mr Murray testified that Mr Frewen's task included the inspection of flight dispatchers' training and competence.
 - However, the operations audit report did not include any observations or non-conformance findings with respect to dispatch and flight watch.
 - Despite extensive evidence heard by this Commission that the training of Air Ontario's flight dispatchers was seriously deficient (see chapter 23, Operational Control), this problem was not uncovered by the audit. Mr Murray explained that since he had been advised by Mr Frewen that Air Ontario's dispatch and flight watch were "satisfactory," there was no further discussion or follow-up.
- 8 Flight documentation
- Journey logs, primarily reviewed by airworthiness inspectors, are cross-checked with pilots' recurrent flying sheets to ensure that pilot flight times are accurate and in accordance with minimum requirements.
 - The flight documentation section of the audit report makes no reference to the F-28.

9 Flight Safety Program

- Air Ontario's Flight Safety Program was reviewed in a most cursory fashion and there is no reference to it in the audit report. According to Mr Murray, auditors reviewed "some of the circulars the company put out on safety," but did not speak with the flight safety officer, Captain Ronald Stewart. Furthermore, Air Ontario's incident - reporting procedure was not reviewed even though the Manual of Regulatory Audits states as a guideline to the inspector responsible for the Flight Safety Program, "Review incident and accident reports for previous twelve months."
- Mr Murray acknowledged that a thorough investigation of the Flight Safety Department would have given the audit team a valuable insight into the actual level of safety at the company.

10 Aircraft documentation

- Aircraft documentation refers to reviewing the validity of journey logs, weight and balance, certificates of airworthiness, and certificates of registration. There is no reference in the audit report to aircraft documentation.

11 Minimum equipment list (MEL)

- The situation pertaining to the F-28's MEL was not inspected (see chapter 16).
- Mr Murray acknowledged that a typical flight inspection of Air Ontario's F-28 operation would likely have revealed the absence of an approved minimum equipment list (MEL) as well as the practice of deferring airworthiness snags pursuant to an unapproved document.

12 Flight inspection

- No flight inspection was conducted on the F-28.

Thus, notwithstanding the stated intention of the audit plan, the Air Ontario F-28 operation was not audited. Moreover, other key areas of Air Ontario's flight operations audit, most notably dispatch/flight watch and the Flight Safety Program, were unsatisfactory to the extent that serious operational deficiencies remained undetected.

Audit of Air Ontario's Northern Operations

Mr Gordon Hill, air carrier inspector and audit team member, inspected Air Ontario's small aircraft operation at its northern sub-bases in Thunder Bay, Timmins, and Pickle Lake. (Pickle Lake and Thunder Bay bases were checked to review the DC-3 and Beech 99 operations, and

Timmins base was checked to review the Beech 200 and Cessna Citation operations.) Because of the divestiture of the Air Ontario's northern assets, it was a time of considerable flux for northern-based personnel. A serious problem in morale resulted. On November 16, 1988, Captain Ronald Stewart, Air Ontario's flight safety officer, described the situation in a memorandum to Mr William Deluce, company president, as "Safety Deficiencies – Northern Operation" (Exhibit 745). It is unclear from the evidence whether Mr Hill was aware of the context or the extent of the transitionary tensions at Air Ontario at the time he conducted his northern base inspections. Nevertheless, he observed a number of problems, particularly at the Thunder Bay base, that he passed on in a report to Mr Murray:

Thunder Bay is a busy hub for Scheduled operations. Many problems were found here. There is no Senior Pilot on this base nor is there a functional Base Manager. Scheduled flights at this base seem to operate smoothly due to the initiatives of the Counter staff and the Pilots. Many Pilots stated that they do not know who to report to on this base; particularly in cases of illness or duty time restrictions. The pilots decide between them what to do in these cases. There is no one to review the pilots' paperwork and check it for completeness and accuracy as required by Section 5 of the Company operations manual. This flight documentation is not kept on base as required above. Pilot Time records are not kept on this base or monitored by the Senior Pilot as stated in the C.O.M. [Company Operating Manual] A current regulatory library could not be located at this base which would normally be kept by the Senior Pilot here.

Training Programs

There is no one in Thunder Bay to co-ordinate recurrent pilot training ... I examined the training files of eight Beech 99 pilots and found that not one pilot record showed required recurrent training. CCP [Company Check Pilot]

Captain R. Hall is the principal Beech 99 check Pilot. He has conducted many Pilot Proficiency flight tests and renewed the qualifications for pilots even though the required recurrent training has not been completed. There was no evidence of a monitor ride on Mr. Hall or Capt. S. Burton the other B99 check Pilot. Mr. Hall could not present me with a valid medical when I requested his Licence Documentation for review.

(Exhibit 1043)

Despite the significant concerns raised by Mr Hill in his report, Mr Dyck, the audit manager for the Air Ontario audit, testified that he had never seen the report prior to his attendance before the Commission. Mr Dyck acknowledged that the report depicted an operation that would have caused him great concern as audit manager, perhaps warranting

further inspection or follow-up action. Though unable to explain why it had not come to his attention during the course of the audit, Mr Dyck did admit that had he been in London rather than Ottawa during the audit, he would more likely have been apprised of Mr Hill's concerns.

I am also concerned by Mr Murray's response to Mr Hill's report. In notes prepared by Mr Murray for the post-audit exit briefing of company officials, he stated that "the general overall operation is considered safe and generally conducted in accordance with industry norms" (Exhibit 1044). Mr Murray when questioned on this point admitted he had not dealt with the matter as he should have:

Q. ... Well, bearing all of these complaints in mind that your own inspector made, and bearing in mind that Thunder Bay was a busy hub, weren't you concerned when you finished reading this report about the situation in Thunder Bay?

Weren't you concerned that there was a serious safety problem here? That ... paperwork was out of control, there wasn't a safety net under the pilots?

A. Yeah, I guess it all points to that, yes.

Q. All right. Then why, in Exhibit 1044 [Mr Murray's exit briefing notes], would you say that general overall operation is considered safe and generally conducted in accordance with industry norms?

A. I guess that was a mistake on my part. That's all I can say.

(Transcript, vol. 134, p. 126)

Mr Hill's report contained important audit findings that were treated too casually by an inexperienced team leader. This view is reinforced by the testimony of Mr Donald Sinclair, who has served with Transport Canada since 1956, for the last 13 years as Ontario Region's manager of air carrier operations. I attach significant weight to his opinion in this matter:

Q. Now, do these notes, then, of Inspector Hill paint a picture of an operation in Thunder Bay which causes you great concern?

A. Yes.

Q. And do you believe that the concern raised by these notes should have been reflected in the audit?

A. Absolutely. My own reaction in reading this for the first time is that, you know, they should not have left the audit to prepare their report without addressing the company right then and there to see whether action should be taken to shut that portion of the service down.

...

It looks urgent enough that I wouldn't want to even, as I say, go back and even write my report knowing this was going on.

(Transcript, vol. 142, pp. 120-21)

Delay in Completing the Audit Report

The operations audit team completed their on-site activities and conducted their post-audit exit briefing of Air Ontario management on or about November 4, 1988. Typically, exit briefings are used by audit teams to present their findings orally to the company audited. The audit handbook provides that, at the end of the exit briefing, the audit team shall advise the auditee that it will provide it with a draft copy of the audit report within 10 days (Audit Procedures Handbook, p. 69, Exhibit 1033). Mr Dyck had reminded the audit team members of this time limit before the commencement of the audit. Further, the audit plan states that "A draft report will be prepared by the audit manager and forwarded to Air Ontario Inc. within 10 working days of the completion of the audit." At the exit briefing, however, Mr Dyck advised an Air Ontario representative that he would "get the report out within two, three weeks" (Transcript, vol. 136, p. 54).

Despite Mr Dyck's good intentions and Transport Canada guidelines, it was not until April 3, 1989, that the operations portion of the audit report was submitted to Air Ontario – five months, rather than 10 days, after completion of the audit. This represents significant inefficiency, which is illustrated by the fact that the airworthiness, dangerous goods, passenger safety, and introductory sections of the report were submitted to the company in timely fashion after the February 1988 audit and make up 167 pages of the 182-page report, while the operations portion of the report accounts for merely 15 pages.

The task of compiling the operations portion of the audit report was a joint effort between the audit manager and the operations team leader. Because Mr Dyck was a maintenance and not an operations expert, he assumed a more administrative or editorial role, while Mr Murray was to compile the report in its vertical analysis format. Mr Dyck described his own role as follows:

- A. [T]o ensure that the report meets the standardized format that we already had established in the initial part of the report [the Airworthiness portion of the report], and that the readability, understandability and the format is in accordance with the procedure that we had established and in the final report that we already had set out. And ensure that all the information was there.

When I say it was there, that we could read the various findings and try and understand them, edit them for obvious errors and omissions.

(Transcript, vol. 136, p. 56)

The inordinate period of time expended to complete the report can be traced to three primary causes: Mr Dyck and Mr Murray did not work effectively together; they were occupied by other tasks; and they were not adequately supported by the air carrier group at headquarters.

Both Mr Dyck and Mr Murray testified that in the November 1988 to April 1989 period, their non-audit work responsibilities took them out of Ottawa (they were both headquarters based) on a number of occasions and they were also very busy with their usual duties. I have no doubt that this was in fact the case and that they were forced, yet again, to juggle the priority of the audit with other pressing matters. Nevertheless, I heard an overwhelming amount of testimony that chronicled a working relationship between the audit manager and the team leader that was unnecessarily bureaucratic, to the point of seriously delaying the completion of the report.

Mr Dyck stated that he returned Mr Murray's drafts to him a number of times because they were not in an acceptable format. However, rather than meeting directly to settle the report (their offices were in the same building), they communicated their comments to one another at times by means of cryptic "post-it" notes that stimulated more confusion than resolution. The delay was exacerbated by a serious lack of secretarial support in both Mr Dyck's and Mr Murray's offices. (Mr Dyck testified that, in his office, there was but one typist to support a group of 20 inspectors). Mr Murray admitted that the entire exercise "could have been accomplished in about a one-minute phone call" (Transcript, vol. 133, p. 211). Similarly, Mr Dyck admitted that the 15 operations vertical analysis sheets could have been completed within one to two hours.

As it became clear that Mr Murray was having difficulty completing the report in the form required by Mr Dyck, swift action should have been taken by Mr Dyck or by Mr Murray's supervisor, Mr Ian Umbach, to preserve the integrity of the report by ensuring its timely completion. As audit manager, Mr Dyck maintained line authority over Mr Murray as well as ultimate responsibility to assemble the audit report. However, in fairness to Mr Dyck, he was saddled with a most difficult predicament. Headquarters had assigned a team leader, who, through inexperience and inability, required assistance to complete the report. Mr Umbach testified that although he was surprised that a person lacking audit experience had been made audit manager, he was also surprised that Mr Murray needed help in writing the report (Transcript, vol. 139, p. 145). At the same time, as an airworthiness professional, Mr Dyck's contribution to the operations report was necessarily limited to matters of style or format as opposed to substance. Accordingly, since it was an operations audit convened by the air carrier group in headquarters, they must share in the responsibility for not acceptably supporting the audit team. In fact, Mr Dyck's frustration did prompt him, on two occasions,

to forward the draft report to Mr Umbach for his assistance in completing it.

I have considered the testimony of Mr Umbach, as well as a memorandum written by Mr Roger Beebe, sympathetic to Mr Dyck's position, indicating that the operations group were chronically slow in completing audit reports. According to Mr Umbach, even though it is no easier for airworthiness to conduct their audit than for operations, it has been his experience that "operations are often slower." Mr Umbach ascribed much of the blame for the delay in getting out the audit reports to foot-dragging on the part of upper management:

- A. My experience has been that with the operations audit, on a national audit, the [operations] report is turned in to our superiors for review, and for various reasons, it doesn't seem to get sent out for sometimes months later.

...

- Q. Can you give us some examples of this type of review?

- A. The report on Canadian Airlines was submitted to our superiors for review, and I believe it was in excess of six or seven months before the report was sent out.

(Transcript, vol. 138, pp. 105-106)

Once again, as in the other problem areas of this audit, responsibility must be shared. In the case of Mr Dyck, as frustrated as he may have been with the operations group, he should have taken the initiative to ensure completion of the report. Similarly, if Mr Murray was unable to complete the report in the prescribed format, it was his responsibility, as a professional, to solicit his superior's assistance. Indeed, to the extent that the problem stemmed from a personality conflict between Mr Murray and Mr Dyck and/or a conflict between the airworthiness and operations groups, I would expect them to recognize that their first priority as professionals was to attend to the business of aviation safety.

The intervening period between the Air Ontario operations audit in November 1988 and the completion of the report in April 1989 was, tragically, marked by the F-28 crash. The realization that the audit report was four months old and unfinished at the time of the accident undoubtedly was an embarrassment to Transport Canada. Both Mr Dyck and Mr Murray admitted that the accident expedited the completion of the unfinished Air Ontario audit report.

Nevertheless, Mr Dyck minimized the importance of prompt dissemination of the report:

- Q. What is the importance of getting the audit report out to the company in quick order?

- A. There is no specific importance other than we try and ... adhere to an administrative process that is timely.

The significance, in a safety sense, is addressed in other manners. We don't necessarily wait for the report to go out to have a safety concern issued or issue discussed.

I guess that's the best way to describe that.

(Transcript, vol. 136, p. 57)

I am of the view, however, that the value of the audit was severely compromised by the tardy release of the audit report. I was convinced of this by the testimony of many Transport Canada witnesses, who, in contrast to Mr Dyck, believe that the release of the report must follow the audit immediately. On this point, Mr Umbach testified as follows:

- A. Because the impact has to be immediate. A lengthy delay and the report loses its impact. The carrier has gone on to other things and so have we.

I believe that for the audit to be effective, the report must be out immediately. And also to get corrective action taken.

(Transcript, vol. 138, p. 107)

Mr Brayman addressed the negative effects of the late report from the perspective of Ontario Region, which had requested the audit of Air Ontario in 1987 to provide a post-merger snapshot of the company. He ventured the opinion that, because of the protracted delay in the production the report, it was virtually useless at the time of its release:

- A. They [audit reports] have to be specific and they have to be punctual. We need them at a specific time.

The whole problem with this report, it was too little and too late. We needed a ... snapshot of the company at the beginning of 1988, not in the spring of 1989.

...

... But in general, events had superseded the information that came through.

(Transcript, vol. 132, pp. 11-12, 15)

Later in his testimony he went on to say:

- A. ... Well, you have to realize that we had been waiting for this audit for a long, long time. And we had – in our normal course of operations, audits were used specifically to clear up problem areas, make corrections.

So the audit was a valuable tool if it was delivered on time. The fact that it was delivered before or after the crash I don't think is pertinent.

I think that the length of time from when the audit was called for to the time that the audit was actually delivered in region is the pertinent issue. And because of that length of time, the audit became virtually worthless.

(Transcript, vol. 132, p. 97)

Deficiencies in the Report

Ontario Region was also dissatisfied with the substantive aspects of the report. After a detailed review, Mr Brayman concluded that it "wasn't really a very well done report ... or of significant value to us" (Transcript, vol. 132, pp. 6, 174). Speaking from the perspective of Ontario Region, he expanded on some of the report's shortcomings, including the lack of reporting on Air Ontario's northern operation:

A. ... during the whole period this audit was going on, the company was under continuous surveillance. We had inspectors and myself and my inspection staff and inspectors from small air carrier. We were in direct contact with the company on a continuing basis, and I knew that there were certain areas that required a fair degree of surveillance.

And when this report come back, it didn't seem to fit what we had experienced up to the time that the report came in. In some cases it did. It overlapped.

Q. Why didn't it fit? What did you expect to see in the audit?

A. Well, I fully expected to see a good deal more about the problems in the north, with the transfer of control in the north.

Q. The denuding of expertise in the north, I think you called it?

A. Yeah.

...

I expected to see more.

We were quite concerned about Pickle Lake, which had been a base where we had had a lot of problems in the past. It was in the central region, but nonetheless, it ... still formed part of this company.

And when I went through the report, I saw very little on some of those activities.

(Transcript, vol. 132, pp. 174-75)

To the extent, therefore, that the audit of Air Ontario was called to provide an independent review of the company at a volatile point in its evolution, it clearly appears to have failed. Not only were the F-28 program, the system operations control (SOC), and the flight safety sections not adequately audited, but there is little evidence to indicate that the audit team devoted particular attention to Air Ontario's special circumstances, such as the merger, the devolution of northern assets, and the continual changes in senior operational management positions.

Moreover, because Ontario Region had expected the F-28 program to be inspected in the audit, the lack of F-28-related non-conformances in the audit report would lead to a natural assumption that Air Ontario was operating a good F-28 program. Both Mr Donald Sinclair and Mr William Slaughter agreed that such an assumption was an “insidiously dangerous conclusion to reach” (Transcript, vol. 142, p. 113; vol. 146, p. 128). Had Ontario Region based its decisions regarding Air Ontario’s F-28 program on the basis of the audit report, it may have concluded that very little surveillance was required. Based on what is now known about Air Ontario’s F-28 operation, that would have been an erroneous conclusion to reach and one obviously based on misinformation.

The Manual of Regulatory Audits that was available to the audit personnel specifically contemplates a pre-audit review of the following factors that might be indicators of instability in the auditee:

- company’s last audit
- high turnover in managerial personnel
- high turnover in flight crew personnel
- change in scope, size, complexity of operations, type of aircraft used, type of service or area served since last audit.

(Based on Exhibit 1034, p. 4-7)

A review of the Company Overview section of the Air Ontario national audit report reveals an inaccuracy that creates the misimpression of stability in senior management. The following list and accompanying text appear under the heading “Senior Management”:

Mr. W. Deluce	– President
Mr. T. Syme	– Vice President of Operations
Mr. R. Nyman	– Director of Flight Operations
Mr. K. Bittle	– Vice President of Maintenance and Engineering
Mr. R. Mauracher	– Director of Maintenance Production
Mr. W. Wolfe	– Chief Pilot
Mr. D. Christian	– Chief Inspector

Mr. Deluce, the President, comes to Air Ontario Inc. from Austin Airways. The remainder of the senior management staff come to Air Ontario Inc. from Air Ontario Ltd. and have served in their current capacities in excess of five years.

(Exhibit 1042, p. 2)

These data are erroneous. Mr Nyman and Mr Bittle came from Austin Airways and not Air Ontario Ltd; Chief Pilot Walter Wolfe was with Air Ontario for a total of 15 months – not “in excess of five years”;

Mr Syme's first operational position was in 1986 and he was first made vice-president of operations in June 1987, so that at the time of the audit he had held that position for less than two years; and Mr Nyman did not become director of flight operations until April 1988. The imprecision of this section of the Company Overview is not in accord with the importance ascribed to it by the Manual of Regulatory Audits and it leaves a mistaken impression of management stability at Air Ontario. As such, it reflects poorly on its authors.

Air Canada's Reliance on the Audit

In chapter 26 I addressed Air Canada's acquisition of Air Ontario, as well as the subsequent course of their parent-subsidiary relationship. Although Air Canada was represented on Air Ontario's board of directors, Air Ontario's operations remained substantially independent from those of Air Canada.

Captain Charles Simpson, vice-president of operations at Air Canada, testified that in 1987 Air Canada had planned to conduct an operational review of its connector airlines. As circumstances unfolded, however, Air Canada put off its operational review of Air Ontario until the summer of 1989 – after the Dryden accident. Captain Simpson testified that one of the reasons for the delay of Air Canada's operational review of Air Ontario in the fall of 1988 was the Transport Canada audit; the other principal reason was an apparent lack of Air Canada personnel to assign to the project:

- A. And the straight reason we were so long was we were having – we weren't having problems but we were in the middle of some very major cutbacks at the time in personnel, and I simply didn't have the personnel to put on the project.

In the fall of '88 ... Transport Canada were doing an audit on Air Ontario, and I had suggested to all our people that we shouldn't become involved until the audit was over.

- Q. That is, the Transport Canada one?

- A. The Transport Canada audit, which, incidentally, was quite a decent audit, gave the airline reasonably good marks. So, of course ... in the early winter, the accident occurred and personnel from Air Ontario were deeply involved in that, so our audit didn't take place until the summer of '89.

...

Hindsight is a great privilege. Obviously, if we thought there was anything wrong with the operation, we would have taken the necessary steps. For some of the reasons I just mentioned, we did not get the operational review done as early as we would like to have conducted it.

Then we saw the Transport Canada audit, which was relatively good.

(Transcript, vol. 118, pp. 166–67, 170–71)

Captain Simpson's characterization of Transport Canada's October 1988 audit of Air Ontario as quite a "decent audit" simply is not in accord with the evidence before this Commission. It should be noted, however, that Captain Simpson testified that he had not read the audit in detail.

Air Canada did not conduct an independent inspection of Air Ontario's operation until the fall of 1989, some six months after the Dryden accident and close to three years after their acquisition of 75 per cent ownership.

Transport Canada is a custodian of the public trust to ensure the safety of civil aviation in Canada. Consequently, there is a clear danger inherent in the regulator passing off substandard work, as indeed occurred here. Air Canada's reliance on the misleading Transport Canada audit report of October 1988 exemplifies this danger and points to the benefits of a major carrier conducting its own monitoring and audits of the operational aspects of its regional subsidiaries. Had Air Canada not relied solely on Transport Canada's audit report, which indicated that Air Ontario was operationally sound, it may have conducted an independent audit of the company and uncovered the numerous Air Ontario operational problems that may have affected the F-28 program.

The audit process is a preventive mechanism designed and used to identify and rectify aviation safety deficiencies. As such, it is an important component in the system approach to aviation safety.

Although, as Captain Simpson stated, "hindsight is a great privilege," it may also be said that foresight is a great virtue.

Findings

- Transport Canada attempted to operate the National Audit Programme without provision of adequate numbers of properly trained or fully competent staff assigned to the task on a dedicated basis.
- Transport Canada management was ineffective in its control and supervision of its 1988 audit of Air Ontario.
- The Transport Canada audit of Air Ontario was poorly organized, incomplete, and ineffective.
- The process of staffing the audit of Air Ontario was neither systematic nor effective:

- The audit manager was not involved in the selection of the operations team leaders, and ineffectual working relationships resulted.
 - Transport Canada's audit policy and procedures manuals in use for the 1988 audit of Air Ontario did not provide guidelines as to required training or experience of team leaders.
 - The operations team leader of the 1988 audit had no prior audit experience, nor had he ever served as a team leader. He was underqualified and should not have been appointed operations team leader.
 - Transport Canada's audit policy and procedures manuals in use for the 1988 audit of Air Ontario provided no system to ensure the orderly secondment of inspectors to serve as audit team members.
- The operations portion of the audit of Air Ontario scheduled for February 1988 should not have been postponed.
 - Appropriate steps should have been taken by Transport Canada to ensure that Air Ontario's flight operations manual was approved and in use prior to the audit.
 - Once the audit team assembled in London, in February 1988, to commence the audit, even without an approved FOM, every effort should have been made to proceed with the audit as scheduled.
 - Although included in the Transport Canada operations audit plan for the October–November 1988 audit, Air Ontario's new F-28 operation was not audited. I find this to have been a serious omission. Had the F-28 been audited, it is reasonable to assume that a number of deficiencies relating to Air Ontario's F-28 operation would have been discovered prior to the Dryden crash.
 - Other key areas of the audit, most notably those covering dispatch/flight watch and the Flight Safety Program, were unsatisfactory to the extent that serious operational deficiencies remained undetected.
 - Although Transport Canada policy states that audit reports are to be released within 10 working days of the completion of the audit, Air Ontario was not presented with the operations portion of the audit report until approximately five months after completion of the audit, and after the Dryden accident. This fact seriously detracted from the credibility and usefulness of the audit.

RECOMMENDATIONS

It is recommended:

- MCR 127 That Transport Canada review and revise its aviation audit policy, under the direction and approval of the assistant deputy minister, aviation.
- MCR 128 That Transport Canada ensure that the rationale for and the importance of the audit program be clearly enunciated to all participating departmental staff and to the aviation industry.
- MCR 129 That Transport Canada ensure that the frequency of audits be based upon a formula that takes into consideration all significant factors, including safety and conformance records, changes in type of operations, mergers, introduction of new equipment, and changes in key personnel.
- MCR 130 That Transport Canada policy confirm that joint air carrier airworthiness and operations audits are the accepted norm, particularly for large companies; however, other types of audits should be identified and flexibility provided to facilitate no-notice mini-audits or inspections, split airworthiness and operations audits where warranted, and audits of specific areas of urgent concern arising from safety issues that are identified from time to time.
- MCR 131 That Transport Canada ensure the availability of qualified managers to manage and coordinate the audit programs.
- MCR 132 That Transport Canada ensure the availability of adequate and qualified personnel to support the audit program.
- MCR 133 That Transport Canada ensure that minimum training and competency requirements be established for specific positions in the audit process.
- MCR 134 That Transport Canada ensure that personnel appointed to an audit have a direct reporting relationship to the audit manager from commencement until completion of the audit and the approval of the final report for that audit.

- MCR 135 That Transport Canada reinforce existing policy that requires audit managers to be readily available to audit staff during the conduct of an audit.
- MCR 136 That Transport Canada policy manuals provide that an air carrier document review process, including a review of prior audits, be completed prior to the commencement of an audit.
- MCR 137 That Transport Canada ensure that time limitations be clearly specified and adhered to within which completion and delivery of audit reports are to be achieved.
- MCR 138 That Transport Canada ensure that procedures for immediate response to critical safety issues identified during an audit be instituted and included in the appropriate Transport Canada manuals, and that such procedures be communicated to the Canadian aviation industry.
- MCR 139 That Transport Canada ensure that trend analyses be produced from the results of audits and used in the formulation of decisions regarding the type, subject, and frequency of audits.

34 OPERATING RULES AND LEGISLATION

The Operating Rules

During the course of the hearings of this Inquiry, a considerable amount of evidence was heard indicating that the existing regulations and orders applicable to Canadian air carriers were deficient, outdated, and in need of overhaul or outright replacement. This was particularly true with respect to the air carrier operating rules, which are contained, for the most part, in Air Navigation Orders (ANOs) Series VII, Nos. 2, 3, and 6.

Flight dispatch requirements, minimum equipment list orders, shoulder harnesses for flight attendants, approval of aircraft operating manuals, and qualifications for air carrier managerial personnel were only a few of the items that were identified in evidence as areas of regulation that required strengthening or where regulation is nonexistent.

This concern is far from new. In 1981-82 the Commission of Inquiry on Aviation Safety under Mr Justice Charles L. Dubin recommended that Transport Canada adopt not only the airworthiness Federal Aviation Regulations (FARs) of the United States but also their companion operational regulations, the operating FARs. The airworthiness FARs were independently adopted by Transport Canada; the operating FARs were not. The following quotation from Mr Dubin's report, dated October 1981, highlights the reasons behind the recommendation:

The proposal to adopt FARs 23, 25, 27, 29, 31, 33, 35 and 37, namely, the airworthiness FARs, caused a considerable debate during the hearings of this phase of the Inquiry. It is to be noted that the proposal of the DOT was to adopt the airworthiness regulations of the United States only, omitting from the proposed enactment the operational FARs previously referred to. It was the Department's position that the adoption of the operational FARs was not necessary because of the existence of adequate operation regulations in Canada. Following a request of this Commission, Mr Donald E. Lamont, Director of Licensing and Inspection, attempted to locate the regulations existing in Canada that would equate to those rules contained in operational FAR 121. Mr Lamont was of course handicapped by the fact that whereas FAR 121 contains all of the rules applicable to the subject, ANO Series VII, No. 2 must be read in conjunction with the Air Regulations, Air Navigation Orders and the Engineering and

Inspection Manual. Mr Lamont presented to the Commission a detailed breakdown of equivalencies and differences. Some operating rules were to be found in flight manuals, and some other sections simply had no Canadian equivalent.

(Report of the Commission of Inquiry on Aviation Safety, vol. 2, pp. 539–40)

This situation still exists today. The present Canadian aviation regulatory requirements reside in a mix of disjointed regulations, orders, manuals, and policy documents that are difficult to comprehend. During the course of the hearings of this Inquiry, many Transport Canada officials were unable to interpret the aviation regulations and orders clearly. A case in point was ANO Series II, No. 20, dealing with minimum equipment lists. The order uses the term “essential airworthiness item,” but not one witness could with any degree of precision define an essential airworthiness item. The evidence of Mr Ronald Armstrong, then Ontario’s regional director of aviation regulation, provides an example of this concern:

Q. Nevertheless, the MEL order, as it is present – as it is currently drafted, simply does not help the pilots, because to interpret it, he’s got to go on this goose chase from regulation to regulation and to documents, some of which may be in foreign languages.

So the result is, the MEL order and the definition of minimum equipment – I’m sorry, essential aircraft equipment specifically is not helpful to pilots; right?

A. No, it is helpful to them, but they have to apply interpretation and judgment in using it. But is it the ultimate answer?

Is that what you’re saying, that they can check off all the boxes to determine whether or not that particular piece of equipment is essential equipment?

No, it’s not at that level of specificity. Is it helpful? The pilot using it, I guess, will make that determination.

Q. Well, I’m going to suggest to you that it’s obvious that it’s not helpful, because it refers the pilots to apparently other pieces of legislation which he wouldn’t have, and that piece of legislation may refer the pilot to documents which he clearly wouldn’t have, which maybe maintenance doesn’t have and which may be in a foreign language.

So the definition simply is not helpful to pilots. Can you not see that?

A. In those bald terms, yes, I can see that.

(Transcript, vol. 125, pp. 128–30)

Mr Justice Dubin in his 1981 report indicated that he was impressed by the evidence of Mr Robert Klein, then the chief airworthiness engineer with de Havilland Aircraft, who had stated the following:

when you are trying to upgrade the total system, the only method available is to put into the operating rules that, after today, nobody may operate an airplane unless it has, for example, fireproof material in the inside and more fire extinguishers, and the upgraded standards.

This sounds like an airworthiness standard, but it is in effect a retroactive application. The only way they can apply this is via the operating rules. But they fit together perfectly.

The other thing that is very interesting is that an airplane that is designed on a certain date is operated in a certain manner, as laid down by the operating rules, and another airplane that is designed at a later date has a different set of operating rules. But one caters for the other in such a way that they seem like a great confusion. But they do fit together beautifully, and I admire the talents of the FAA to keep this can of worms sorted out and make it very clear as to just what everybody is supposed to do, and the operators and the designers understand this.

*(Report of the Commission of Inquiry on
Aviation Safety, vol. 2, p. 540)*

Another key area pursued with Mr Klein was the probability that a modification of an airworthiness standard might result in a corresponding change in the operating standard. Mr Klein pointed out that airworthiness certification rules, which are fixed, are interrelated with the operating rules, which are amended from time to time:

You may upgrade one at a time if there is no need to make a corresponding change, but if they are inter-related, then the same amendment can be effective in Part 25 and 121. They are both upgraded simultaneously in the same Notice of Proposed Rule Making, and you get two different amendments to the two different books.

...

The airworthiness rules are frozen. Once you have been certified to a certain basis of certification – for instance, the 727 that we are still buying new copies of, was designed to the standards of Part 4b. The Series 100 was the initial series and the Series 200 is the later series; but it is still to the original basis of certification, because the type is the 727, and there is nothing to stop them from coming out with a Series 300 and 400 and 600 and 900. For the next 50 years it will still be to the standards of Part 4b. So that there is no way that these later amendments of 25 [FAR 25] will ever show up.

(Ibid., p. 541)

Mr Klein identified a fundamental problem with the structure of the Canadian regulations. While Canada has adopted the United States design and certification standards, we do not even today, some ten years

after Mr Justice Dubin made the specific recommendation, have in place an equivalent set of operating rules to ensure that when a change is made to a design standard that effects a corresponding operating rule, the operating rule is amended simultaneously.

In many instances the existing Canadian airworthiness rules do not have corresponding Canadian operating rules. For example, nothing is mentioned in either the Air Regulations or the Air Navigation Orders setting out a requirement that turbine-powered commercial aircraft be operated in conformity with the takeoff limitations specified in the approved aircraft flight manual. It is an obvious operating requirement that, at present, has no home within Canadian operating rules. The Transport Canada airworthiness authority deals with this issue in the aircraft flight manual requirements as an airworthiness requirement as part of the airworthiness manual, which is enabled by regulation.

Unfortunately, for a commercial or airline transport pilot, the requirement and the regulatory process that make it a rule are so convoluted that it is nearly impossible to ascertain, first, what is the Canadian requirement; second, in what publications is it located; and, third, what makes it a regulation. In contrast, in the United States, FAR 121.189 entitled "Transport category airplanes: turbine engine powered: takeoff limitations," sets out the requirement for a commercial operator to adhere to factors such as weight, altitude, temperature takeoff limitations, accelerate-stop distances, and takeoff distances. The irony of the situation is that the analogous Canadian requirements, notwithstanding the complicated and bewildering manner in which they are set out, find their origin in FAR 121. It would have made much better sense to have adopted FAR 121 in the first place.

As a further example, the United States operational rule FAR 121.141 requires that each commercially operated transport category aircraft shall have on board an aircraft flight manual or an aircraft operating manual with revised (and more readily accessible) performance data and procedures, approved by the administrator. Transport Canada has no requirement to approve air carrier-generated aircraft operating manuals to ensure that they are in conformance with and are no less restrictive than the approved aircraft flight manual. It is worthy of note that the two pilots on board C-FONF on March 10, 1989, carried two aircraft operating manuals, differing in form and content and neither having an amendment service (see chapter 19, F-28 Program: Flight Operations Manuals). The manuals were not approved by Transport Canada, since there was no regulatory requirement to do so. The ramifications for flight safety are obvious.

Mr Justice Dubin recommended the adoption of FAR airworthiness standards. He indicated that in his view it would be wasteful of expertise, manpower, and funds for Canada to draft its own code. The

evidence I have heard leaves no doubt whatsoever that he was right. However, he went beyond the airworthiness code and made recommendations for the adoption by Transport Canada of the corresponding FAR operating rules:

Transport Canada has been moving towards the adoption of a series of the Federal Aviation Airworthiness Regulations, but proposes to delete from the Canadian code the Federal Aviation Operational Regulations. I am satisfied that to do so would be a mistake. What is needed is a complete code available from one source. The failure to adopt the Federal Aviation Operational Regulations which are interrelated with the Federal Aviation Airworthiness requirements would lead to future complication and uncertainty and would fail to achieve the necessary objective.

(Report of the Commission of Inquiry into Aviation Safety, vol. 2, p. 542)

The point being made was that the United States operational rules were an integral part of the airworthiness regulations and were equally as important as the airworthiness regulations to airline safety:

Although styled as the operational requirements, the Federal Aviation Operational Regulations include many airworthiness standards and, as is pointed out, the Operational Regulations are an integral part of an airworthiness code. The Operational Regulations update airworthiness requirements and are equally important in contributing to aviation safety. As previously noted, the current Canadian airworthiness standards are to be found in a myriad of documentation. A close study of them may disclose comparable standards to those that now form part of the operational FARs. In many cases, however, there is an absence of identical or equivalent standards. In my opinion the airworthiness FARs and operational FARs should be used and adapted as the model for a Canadian Airworthiness Code.

(Ibid.)

These observations and recommendations are, in my view, as valid today as they were when they were made ten years ago. In 1982 the FAR design requirements, along with International Civil Aviation Organization (ICAO) Annex 6, Operation of Aircraft, and Joint Aviation Requirement (JAR) 22, were in fact adopted in Canada and now form the basis of certain chapters of the Transport Canada airworthiness manual. Inexplicably, Transport Canada did not adopt the FAR operational rules. Its failure to do so is very questionable.

Had Transport Canada adopted the FAR operational rules when it adopted the FAR design and certification requirements, Air Ontario aircraft C-FONF would in all probability have been equipped with flight attendant shoulder harnesses on March 10, 1989, and the flight crew of C-FONF would have been required to have a common and approved aircraft operating manual. Mr David Adams, an investigator from CASB seconded to this Inquiry, described the Canadian regulatory requirements for seats for flight attendants, as they existed at the time of the Air Ontario accident:

Q. Now, I would like you to turn to page 110 of your report, and it deals with the FAR requirements and Transport Canada requirements for shoulder harness ... for cabin attendant seats.

Can you discuss that for the Commissioner?

A. Yes ... Canada, like many countries, accepts the U.S. specifications and regulations to do with a lot of things involved with aircraft operation.

Now, the United States had a Federal Aviation Regulation 25.785, which is primarily a design regulation. And it basically said, okay, as of a particular date, all aircraft constructed and submitted for certification must have seats that provide back and arm and neck support, and they must have ... shoulder harnesses as part of the seat belt.

Canada accepted that particular FAR.

The Americans then introduced a second FAR which was a ... Federal Aviation Regulation – FAR 121.311. Now, it is an operational regulation as opposed to a design regulation.

Now, that operational regulation basically said, all aircraft that are being used for major regular passenger transport services, irrespective of when they were designed or certified, must have the new seats that provide back and arm and neck support and shoulder harnesses.

So, in effect, FAR 121 made FAR 25.7 retroactive so that it covered all aircraft.

Whereas Canada accepted FAR 25.785, they had not at the time of the accident accepted FAR 121.311.

So, in other words, in this country you were not necessarily required to have the new seats or the shoulder harnesses, depending on when your aircraft was certified. This was the case with the Air Ontario F-28 C-FONF. It was not, under Canadian regulations, required to have the shoulder harnesses or the new seats.

(Transcript, vol. 157, pp. 81-84)

Adequacy of Canadian Operating Rules: The View of Transport Canada Operational Staff

The Transport Canada operational staff who testified at this Inquiry, when questioned about the adequacy of the existing ANO Series VII, No. 2, were unanimous in their view that the ANO was deficient in a number of areas. Mr Martin Brayman, a former superintendent of air carrier inspection for Ontario Region, gave the following evidence about the adequacy of the Canadian operating rules:

- A. There are numerous areas that are not covered specifically in the ANOs.

...

Or in sufficient detail. And I would have to say that those areas dealing with dispatch centres, that's one area. There are several others.

(Transcript, vol. 131, p. 112)

Mr Ian Umbach, Transport Canada's superintendent of air carrier operations (large aeroplanes) in Ottawa, was a witness whom I perceived to be genuinely committed to aviation safety. He expressed the obvious frustration that many Transport Canada witnesses, pilots, and air carrier officials who testified felt for the chronic inaction on the part of Transport Canada senior management in many areas of urgent concern, including the replacement of the outdated ANOs and regulations. Mr Umbach testified that more than eight years ago, "the department began a rewrite of the existing regulations and ANOs," but that "they have never appeared." He stressed that there is "an urgent need for current, topical and specific regulations." He stated that "in their absence, we end up improvising policy, publishing policy manuals, and the industry itself is advancing at such a rapid pace that we are having difficulty keeping up." He gave his view of what is necessary:

- A. ...

And it's my strong belief that we need, as I said, current, topical regulations for the control and regulation of our air carrier industry, and we don't have them.

(Transcript, vol. 139, p. 23)

Mr Umbach was asked whether, for large air carrier inspection, the Air Navigation Order Series VII assists him in the fullest extent in carrying out his duties and responsibilities. His reply was succinct and graphic:

- A. No. It's outdated. It's vague. It's open to varied interpretation. It doesn't address a wide variety of the items now facing the air carrier industry and us.

(Transcript, vol. 139, pp. 23-24)

On his own initiative, Mr Umbach, while on the witness stand on November 17, 1990, presented a list of eleven recommendations for urgently needed regulatory changes, the first of which was: "Revise the air regulations and ANOs on a priority basis" (Transcript, vol. 139, pp. 23-24). When asked for his view of the United States operational rules, the FAR 121, Mr Umbach unequivocally stated before this Inquiry that the FAR 121 operating rules were exactly what is needed in Canada:

Q. What is your view of FAR 121?

- A. I think it is exactly what we need. It is current, topical and specific.

(Transcript, vol. 139, pp. 25-26)

Mr Umbach agreed that special conditions, based on Canadian experience and required for Canadian aviation purposes, should be addressed in the context of an adoption of FAR 121. He was most emphatic when asked whether he recommended that the United States Operational Regulation, FAR 121, should be used and adapted for a Canadian airworthiness code:

- A. Yes, I do.

Q. And when should it be done?

- A. Immediately.

(Transcript, vol. 139, p. 26)

I could not agree more. The time is long past for action in this regard.

Mr William Slaughter, Transport Canada's director of flight standards, supported Mr Umbach's views in this regard. During his testimony before this Inquiry Mr Slaughter acknowledged that, although the *Aeronautics Act* has been rewritten to replace the original Act that dated back to 1919, "the regulations have not yet caught up with the Act." He gave the following evidence:

Q. Now, do you agree with me that at the time, five years ago, and still now, aviation safety legislation in Canada is in serious need of revision and overhaul?

- A. Yes, sir, the regulations, I believe, and it has been documented here [during the hearings of this Commission of Inquiry], are woefully out of date.

(Transcript, vol. 147, p. 85)

Mr Slaughter testified that inadequate finances and personnel had a negative impact on the ability of the Aviation Regulation Directorate to carry out its daily tasks and to do the planning, developing, and reviewing of the regulations to meet the challenges of ongoing technology. He candidly admitted that given his workload and the resources available, he could not give the assurance that everything is being done in compliance with current regulations.

Mr Slaughter was unable to explain the failure by Transport Canada to adopt the operational FARs. He too left no doubt that adoption of the entire FAR system was appropriate and sensible:

- A. So the reason we did not adopt the FAR system as recommended by Justice Dubin, I don't know, and that's outside my area of responsibility and authority. But certainly I'm comfortable ... with using the FAR regulations and would be quite content if we adopted that system throughout, from my own opinion.

(Transcript, vol. 145, p. 92)

Mr Slaughter's testimony implies that the reason for the failure to adopt the operational FARs lay beyond his area of jurisdiction and with the upper management of the Aviation Regulation Directorate. Mr Weldon Newton, director-general of aviation regulation, when questioned about the matter, simply indicated in his evidence that Transport Canada chose not to accept Mr Justice Dubin's recommendation for the adoption of the United States operational FARs concurrently with its adoption of the United States airworthiness FARs. Instead of following this recommendation, it is clear from the evidence that the Aviation Regulation Directorate has, in effect, attempted for the past ten years to restructure the Canadian air carrier operating rules so as to eliminate the ANOs and to have only regulations. According to Mr Newton's evidence, given in late January 1991, the draft regulations referred to by him had not yet been implemented but had recently been submitted to the Department of Justice for review.

It is a matter of major concern that the Aviation Regulation Directorate's decade-long waste of time, expertise, and resources on an as yet incomplete activity could and should have been avoided. Adoption of Mr Justice Dubin's recommendation regarding the United States FAR operational rules would have provided effective operating rules in many areas of Canadian regulations found deficient in the course of this Inquiry. In addition, although Mr Donald Douglas, in his report, identified a serious problem with Canadian air regulations as far back as 1986 (see chapter 30, *Effects of Deregulation and Downsizing on Aviation Safety*), the evidence before this Commission shows that little was done to address the problem effectively in the years that followed.

One of Mr Umbach's list of recommendations aimed at correcting the unsatisfactory state of Canadian air regulations concerned the issue of contracting-out within an international aviation environment:

Q. Your next recommendation is improve regulations applicable to air carriers contracting maintenance, flight watch, et cetera.

Can you generally deal with that recommendation?

A. It generally refers to my first recommendation ... that we need better regulations to meet rapidly changing developments in the air carrier industry.

New trends are developing constantly. Flight watch certification is inadequately addressed in current regulations. The present manuals, well, for flight watch, we don't have a manual. The certification manual isn't as specific as it should be to meet changing developments.

New practices are being entered into on a global scale now that we are, at the moment, ill-prepared to meet.

(Transcript, vol. 139, pp. 29-30)

The obvious solution to challenges posed by the new global aviation environment lies in the development and acceptance of uniform design, certification, maintenance, and operational regulations, a direction in which the European Community is now headed. It is known that Europe's Joint Aviation Authorities (JAA) and the FAA in the United States have both recognized the need for greater commonality not only in aircraft design and certification requirements but also in their respective operating regulations. In that regard, the JAA has set up a joint board of operations to address operational issues such as flight crew and cabin attendants' flight duty time limitations, crew operating procedures, aircraft operational procedures, flight operations, and aircraft operating manuals as well as carrier certification procedures. One of their prime objectives is to achieve close cross-reference compatibility with the FARs.

The international aviation community is thus, by necessity, being steadily drawn towards the development and adoption of universal, harmonized design, maintenance, and operating standards. The end product will no doubt be a compromise between upgraded versions of the FARs and the JARs. By adopting the FAR operating rules as the Canadian model, and enhancing these rules where warranted, Canada would be in a far better position to accommodate the changing international aviation environment than it would with its own unique code of operating regulations.

It is worth noting that Transport Canada's Airworthiness Manual uses a split-page approach displaying the FAR certification rule in the left column and the Canadian rule in the right column. If the two rules are

identical it simply indicates "no change." However, if there is a difference, it is noted in the right column. This seems a sensible approach that should have been used as well for Canadian air carrier operating rules.

During Mr Newton's testimony he undertook to provide to this Inquiry a copy of the proposed revised operating rules. This undertaking was subsequently withdrawn by Transport Canada's counsel in a letter to commission counsel dated February 15, 1991, claiming Queen's Privilege under the *Canada Evidence Act* (see chapter 43). I found this position both surprising and disappointing, given that these draft regulations had already been submitted for review to various associations representing different segments of the aviation industry. Nevertheless, they were denied to a Commission of Inquiry charged with the responsibility of examining matters pertaining to aviation safety with the pledged full support of the minister of transport. I am therefore unable to offer comment on the suitability of the proposed changes but I would strongly urge that if they do not fully address the concerns expressed herein, the entire issue of the draft Transport Canada air carrier operating rules be reconsidered, with a view to expeditiously adopting the United States FAR 121 operating rules, while monitoring any future harmonization between them and the European JARs.

In the event that the FAR 121 operating rules are adopted as a model for a revised Canadian regulatory scheme, I suggest that Transport Canada retain an expert in the application of the FARs to assist in their transition to the Canadian regime and to point out any deficiencies in their current application in the United States. The goal should be to have an improved set of FARs applied to the Canadian scene.

The Legislative Process: Undue Delay in Rule Making

The evidence before this Inquiry leaves no doubt that it takes an inordinate length of time to put into place adequate legislation related to aviation safety, a problem that causes delays in the timely introduction of, or urgently required changes to, the operating rules. The Transport Canada Review Group, in May 1990, published a report on the Evaluation of Aviation Regulation and Safety Programs, which was conducted by direction of the deputy minister (Exhibit 1323). That report made specific reference to the problem of such delay and included recommendations for resolution. The following are excerpts from that document:

5.2 TCAG Rulemaking – Efficiency

The 1989 Federal Regulatory Plan listed 200 regulations that Transport Canada intended to adopt, of which Aviation's total is 43.

The process is slow, and not many regulations have been pre-published in Part I of the Gazette. From January 1, 1987 to June 30, 1989, twenty-one of the proposed regulations of those considered were the subject of such notices. Of comparable interest, only nine of the 21 regulations pre-published have yet passed into law. At this rate, even discharging the present burden of planned [Transport Canada Aviation Group] TCAG regulations will take nearly five years. As an example, the regulations (old ANO Series VII) relating to air carrier operations had been in process for over 7 years.

Accordingly, given the current track record, it is difficult to see how unexpected new demands and priorities, such as the possible rule on compulsory de-icing of aircraft arising from the Dryden Inquiry can be properly addressed.

5.3 Priority Setting

None of the three organizations in TCAG's rulemaking structure presently carry out priority-setting for regulatory developments. Indeed, there is no mention of priority setting in the AR Rulemaking Policy and Procedures Manual. Any priority setting to the extent it currently occurs at all, appears to be done on an ad hoc basis by the Minister's office.

The current practice regarding the decision in TCAG on whether to develop a particular rule, is made by the Civil Aviation Rules Committee (CARC). Only if there is disagreement do the Directors General concerned in TCAG become involved to settle the matter.

It is often the case for branch directors who are members of the CARC to be represented by their Chiefs of Standards. It appears therefore that decisions on whether to develop a particular regulation are effectively made at the Chief level.

An improvement to this system would be the development of priorities (based primarily on safety or risk considerations) by a senior departmental committee, for approval or change by the Minister. This could be revised every six months or so, and would represent the basis for regulatory priorities and development.

Such a committee would also ensure that there are appropriate challenges to both the priorities and the rules themselves, so that only the most important regulations would be developed and produced. The committee would also help to concentrate departmental effort on blockages in the system (both internally and, more significantly, externally), and press for appropriate action to deal with them.

The recommendations contained in this excerpt from the Review Group report are, in my view, appropriate and a step in the right direction. I would go further, however, and suggest that a senior member of the Privy Council staff be included in the membership of the recommended senior legislative review committee, thereby assuring recognition of the importance of the issues at a level that could influence facilitation of appropriate priority in the legislative process.

Findings

- The recommendation made in the 1981 *Report of the Commission of Inquiry on Aviation Safety* that “the airworthiness FARs and operational FARs should be used and adapted as the model for the Canadian airworthiness code” is as valid today as it was in 1981.
- The decision by senior management of Transport Canada not to adopt the United States FAR operating rules at the same time as it adopted the United States airworthiness FARs, contrary to the recommendation of the Commission of Inquiry on Aviation Safety in 1981, was a fundamental mistake.
- As a result of the failure by Transport Canada to adopt the United States FAR operating rules, the Canadian aviation operating rules continue to reside in disjointed regulations, orders, manuals, and policy documents that are difficult to comprehend, even by those responsible for their enforcement.
- The decision taken by senior management in the Aviation Regulation Directorate to attempt to rationalize the chaotic situation regarding Canadian operating rules by drafting its own operating rules to complement the United States airworthiness FAR, which, paradoxically, it willingly adopted, has been an unnecessary and wasteful exercise, and one that has not produced any tangible results.

- The views of working-level inspectors regarding the urgent need for adoption of the FARs was either not transmitted to, or not accepted by, senior Transport Canada aviation management.
- The Transport Canada operational managers and staff who testified on the point were unanimous in their view that the existing Air Navigation Orders and operating rules were ambiguous and deficient and that Canadian adoption of the operating FARs would represent a significant improvement.
- There is an urgent need for a legislative mechanism to enable the expediting or fast-tracking within Transport Canada of necessary changes to regulations and operating rules that have the greatest impact on aviation safety.
- The recommendations contained in section 5.2 and 5.3 of the May 1990 evaluation of Aviation Regulation and Safety Programs, conducted by the Transport Canada Review Group, if implemented, would offer significant improvements in the area of priority-setting for regulatory developments.
- Had Transport Canada adopted the FAR operating rules at the same time that it adopted the FAR airworthiness rules, the unnecessary commitment of human resources and expertise and the expenditure of public funds since 1981 in the pursuit of the questionable goal of producing made-in-Canada operating rules could have been avoided.
- Had Transport Canada adopted the FAR operating rules, as recommended in 1981, they would have required that the aircraft C-FONF be equipped with flight attendant shoulder harnesses and that the flight crew of C-FONF have a common and approved aircraft operating manual.

RECOMMENDATIONS

It is recommended:

- MCR 140** That Transport Canada ensure that managers and inspectors responsible for the application of operating rules are consulted on proposed changes to such rules.

- MCR 141 That if the proposed draft operating rules currently being developed by Transport Canada do not fully address and satisfy the concerns identified by this Inquiry and expressed herein, then the entire matter of air carrier operating rules be reconsidered by Transport Canada with a view to adopting the United States Federal Aviation Regulation operating rules applying to air carriers for the Canadian regulatory scheme, amended or supplemented as necessary to accommodate Canadian conditions and purposes, on the highest possible priority basis.
- MCR 142 That in the event that the United States Federal Aviation Regulation (FAR) operating rules are adopted by Transport Canada for a required Canadian regulatory scheme, Transport Canada retain an expert in the application of the FARs to assist in their transition into the Canadian regulatory regime.
- MCR 143 That in the event of adoption of the United States Federal Aviation Regulation operating rules for a revised Canadian regulatory scheme, all the recommendations contained in this Final Report and in my Interim Reports proposing amendments or changes to existing Air Navigation Orders and Regulations be incorporated accordingly in order to give full meaning and effect to the subject matter under consideration.
- MCR 144 That Transport Canada monitor the efforts of the United States Federal Aviation Administration and the European Joint Aviation Authorities to achieve greater commonality in aircraft design and certification requirements and in operating regulations, with a view to achieving harmonization of Canadian airworthiness and operating rules with the changing international aviation environment.
- MCR 145 That Transport Canada adopt the recommendations contained in sections 5.2 and 5.3 of the May 1990 evaluation of Aviation Regulation and Safety Programs, regarding priority setting for regulatory developments and the rule-making process.
- MCR 146 That a senior member of the Privy Council staff be included in the proposed senior departmental review committee for priority setting.

35 COMPANY CHECK PILOT

A company check pilot (CCP) is a pilot, employed by a carrier or agency, who has been authorized by Transport Canada to conduct certain tasks on behalf of the department in accordance with the Air Regulations and Air Navigation Orders. The issues regarding company check pilots gave rise to a great deal of testimony from a number of Air Ontario flight operations staff and Transport Canada witnesses.

Delegated Authority

A CCP may be designated as having "A" authority, "B" authority, or both. "A" authority allows the CCP to conduct pilot proficiency checks and instrument rating renewals. "B" authority allows a CCP to carry out line indoctrination and to conduct line checks, a process that each air carrier pilot is required to follow before being approved as a line pilot on a large aircraft.

Mr Ian Umbach, superintendent of air carrier operations, Transport Canada, testified that CCPs normally conduct only recurrent checks on experienced pilots, whereas Transport Canada air carrier inspectors carry out all the initial ratings and upgrades. The evidence shows, however, that during the latter part of the 1980s even initial type ratings were assigned to CCPs because there were insufficient air carrier inspectors to cope with the large numbers of pilot proficiency checks.

Simply put, Transport Canada delegates authority to qualified individuals to conduct tasks that would otherwise have to be carried out by air carrier inspectors. The evidence indicates that, generally, the process has worked well over the years. It offers a convenience to the carriers as well as a cost saving to Transport Canada.

CCP candidates are subject to a Transport Canada screening process prior to their receiving delegation of "A" or "B" authority. In the screening, both the carrier and the designee are required to meet a number of prerequisites that are set out in Transport Canada's Air Carrier Check Pilot Manual.

Further Delegation to CCPs

Throughout the latter part of the 1980s, Transport Canada's air carrier inspectors were almost totally occupied with pilot proficiency checks and

certification paperwork. In-flight inspections were for the most part abandoned, notwithstanding the fact that the more experienced inspectors considered that in-flight inspections gave them the best picture of the health of a carrier's operation from a safety viewpoint.

Based on all of the evidence I have heard, I am of the view that Transport Canada should consider pursuing a program that would lead to further delegation of authority to CCPs with air carriers that have demonstrated an exemplary safety record and that have in place mature pilot training and checking programs. To such air carriers, the delegation of authority with respect to initial pilot proficiency checks and upgrades should be considered as well. It is essential, however, that Transport Canada provide a comprehensive CCP-monitoring program of both the designated CCPs and a representative cross-section of each air carrier's pilots, in order to ensure that the standards are being properly applied and maintained. Transport Canada should reserve the right to have its air carrier inspectors conduct any pilot proficiency check it sees fit, and without notice. Transport Canada should also conduct initial pilot proficiency checks and upgrades with every air carrier in cases where a new aircraft is being introduced, to ensure that the required standard is maintained within that carrier's operation.

The savings in person-years that might accrue to Transport Canada from such a program should be redirected to in-flight inspection and air carrier surveillance programs.

Air Carrier Check Pilot Manual Deficiencies: Conflict of Interest

The use of company check pilots raises a number of issues, including that of conflict of interest. This issue surfaced when it was disclosed in evidence that Captain Joseph Deluce, who had a significant financial interest in Air Ontario, was designated as an Air Ontario CCP. The Air Carrier Check Pilot Manual issued by Transport Canada (Exhibit 1022) contains two brief and extremely vague paragraphs pertaining to conflict of interest on the part of a CCP candidate, and nowhere does it define the term "conflict of interest":

A pilot having an interest in a carrier will not be granted CCP authority where the facts and circumstances indicate a possible conflict of interest.

(Exhibit 1022, Section 1, p. 3, section 1-11)

The D.O.T. Manager Superintendent or Supervisor in the office of prime interest for a carrier may recommend approval of a nominee

not meeting all of the stated requirements. Justification to be included on nomination for CCP form. A waiver to CCP qualification must be approved by Ottawa Headquarters.

(section 1-14)

Although there was no evidence that Captain Deluce improperly exercised his authority as a company check pilot, the critical question, totally unanswered by the Air Carrier Check Pilot Manual, is under what conditions or circumstances is an interest in a carrier to be considered as representing a conflict of interest? According to the interpretation of Mr Martin Brayman, former superintendent of air carrier inspection (large aeroplanes) for Ontario Region, the appointment of Captain Deluce to the position of CCP within Air Ontario did not represent a conflict of interest. However, the existing Transport Canada criteria intended to provide guidance to the regulator in this regard are extremely sparse and, at best, a less than definitive basis upon which to determine conflict of interest. Mr Umbach, in his testimony, acknowledged discussing with Mr Brayman the possibility that Captain Deluce was in a position of conflict of interest because of his shareholdings in Air Ontario. He stated that he relied on Mr Brayman's advice that Captain Deluce could be considered a "working pilot," and therefore not in a conflict position. He conceded that conflict of interest was not well defined and that there were no guidelines provided to inspectors by which to assess financial interests in a carrier:

- Q. Now, in so doing, in granting the approval, did at any time you discuss – recall discussing with Mr Brayman or anyone else in Ontario region a matter of the issue of possible conflict of interest?
- A. I don't recall the details, but I recall Mr Brayman calling me about this matter.
- Q. And do you recall what – generally, what discussions took place?
- A. Mr Deluce had an interest in the company and that Mr Brayman had investigated it and that, in his opinion, the interest was small enough that Mr Deluce could be considered a working pilot for this purpose.
- Q. And I take it that you ... relied on Mr Brayman's recommendation?
- A. I did, totally.
- ...
- Q. But, as it stands now, conflict of interest is not really defined very well?
- A. No.

- Q. Does Transport Canada, in your mind, have anything available to it to allow it to assess financial interests of any individual?
- A. No.
- Q. Would that be a good idea?
- A. Yes.

(Transcript, vol. 139, pp. 19, 22)

The issue of conflict of interest, however, can have implications in areas other than a pure financial interest in a carrier. For example, a CCP who conducts a line check on a pilot with whom he or she has carried out line indoctrination could be seen as having a conflict of interest. A CCP who conducts a pilot proficiency check on a pilot who has been trained by that same CCP would be seen as in a conflict of interest. Clearly a pilot should not be put in the position of evaluating the product of his or her own training. Moreover, a CCP should not carry out pilot proficiency checks or line checks on his or her superiors. Such an arrangement would obviously be intimidating to the CCP because of the likely perception of potential career implications on the part of the CCP.

Mr Umbach, in his evidence, recognized that the term "conflict of interest," as it applies to CCPs, encompasses far more than financial interest in a carrier. His understanding of the term was as follows:

- Q. Now, when you are dealing with conflict of interest, I take it – can you tell me what you mean – what your understanding of conflict of interest would be?
- A. It would mean the person would have a division of desires or benefits in performing one task as opposed to the other.
- In this case, it could mean he would have monetary benefits or other financial benefits by biasing himself towards his interest in the carrier rather than representing us as a CCP.
- Q. And that's your interpretation?
- A. That's mine.

(Transcript, vol. 139, p. 21)

These considerations are covered for the most part in the Air Carrier Check Pilot Manual, but were not always followed in the latter part of the 1980s owing to the fact that inspector workloads precluded strict adherence.

The inadequacies of the existing provisions should be reviewed by Transport Canada. The lack of criteria for use by the regulators in assessing conflict of interest on the part of CCP candidates is a problem that merits attention.

ACI and CCP Proficiency Requirements to Conduct Pilot Proficiency Checks

During the course of the hearings, evidence was heard that not all air carrier inspectors (ACIs) assigned to carry out pilot proficiency checks were type-rated on the aircraft in which they were conducting the checks. The Air Carrier Inspector (Large Aeroplanes) Manual indicates that air carrier inspectors conducting pilot proficiency checks on turbojet aircraft will normally be qualified and current, pursuant to ANO Series VII, No. 2, on the aircraft type used for the proficiency check. The manual further states that, when authorized by headquarters:

- (a) an inspector rated but not current on the aeroplane type may be used on temporary assignment or,
- (b) an inspector rated and current on a similar aeroplane type may be used on temporary assignment.

(Exhibit 960, p. 1-11)

The key words are "similar aeroplane type."

According to a letter dated November 10, 1989, signed by Mr Richard Peters, chairman of the Aircraft Operations Group, to the then minister of transport, Mr Benoît Bouchard, air carrier inspectors were conducting proficiency checks on aircraft types for which they were not type rated. It was subsequently brought to my attention, during the Commission hearings, that the two aircraft types in issue were the Boeing 737 and the Boeing 747. My own view, and that of numerous inspectors and professional pilots who testified, is that the only similarity between the two aircraft is that they are both jet transport aircraft manufactured by the same company. Surely it is wrong in principle to assign a Boeing 737-qualified inspector to perform a proficiency check on a Boeing 747 pilot.

The evidence shows that this was not an isolated occurrence. Even Mr William Slaughter, Transport Canada's director of flight standards, agreed that this was a poor state of affairs. It was conceded by both Mr Slaughter and Mr David Wightman, assistant deputy minister, aviation, that action would have to be taken to ensure that such an occurrence would not be repeated. While acknowledging that the views expressed by Mr Wightman and Mr Slaughter in this regard are constructive, I believe it is essential that Transport Canada take appropriate steps to require that all pilot proficiency checks on aircraft over 12,500 pounds and on all turbojet aircraft be conducted only by air carrier inspectors or CCPs holding a current rating on such aircraft.

The Advanced Qualification Program (United States)

Dr Robert Helmreich in his testimony referred to a new program being instituted in the United States called the Advanced Qualification Program (AQP). This program provides a voluntary alternative that air carriers may use in order to meet the training and checking requirements of the Federal Aviation Regulations. If implemented, this program may result in different flight training and checking concepts. The AQP program is addressed in chapter 20, F-28 Program: Flight Operations Training.

Findings

- The system by which Transport Canada delegates authority to qualified individuals among the air carriers to conduct tasks that otherwise have to be carried out by Transport Canada air carrier inspectors has generally worked well, offering a convenience to carriers and a cost saving to Transport Canada.
- There is a strong case for further delegation of authority to CCPs with air carriers that have demonstrated an exemplary safety record and have mature pilot training and checking programs in place.
- There is an additional need for Transport Canada to conduct, from time to time, pilot proficiency checks on air carrier line pilots, without prior notice, to ensure that appropriate standards are maintained.
- Because of the inadequate number of air carrier inspectors it had throughout the latter half of the 1980s, the Transport Canada Aviation Regulation Directorate resorted to the unacceptable practice of assigning inspectors to perform pilot proficiency checks on aircraft types on which the inspectors themselves were not qualified.
- The existing Transport Canada provisions and criteria for use by air carrier inspectors, in assessing conflict of interest on the part of CCP candidates, are inadequate.
- Although the Transport Canada Air Carrier Check Pilot Manual prohibits the granting of CCP authority to a pilot "where the facts and circumstances indicate a possible conflict of interest," there is no definition in the manual of the term "conflict of interest."
- The lack of definition of the term "conflict of interest" in the Air

Carrier Check Pilot Manual is an omission requiring rectification.

- There is a lack of a clear definition of the term “generically similar aircraft” in all applicable Transport Canada regulations and supporting manuals.
- The air carrier inspectors are not provided by Transport Canada with any guidelines by which to assess financial interests of a pilot in a carrier in the context of a possible conflict of interest. This results in inconsistent decisions, varying from inspector to inspector, where consistency should be the norm.
- The Air Carrier Check Pilot Manual fails to spell out clearly that the issue of conflict of interest, as it relates to CCPs, can have implications involving matters other than pure financial interest.

RECOMMENDATIONS

It is recommended:

- MCR 147** That Transport Canada pursue a program that would lead to further delegation of authority to company check pilots with air carriers that have demonstrated an exemplary safety record and have in place mature programs for training and checking pilots. To such carriers, delegation of authority with respect to initial pilot proficiency checks and pilot upgrades should be considered as well.
- MCR 148** That Transport Canada provide a comprehensive monitoring program of both designated company check pilots and a representative cross-section of each company's pilots to ensure that standards are being properly applied and maintained.
- MCR 149** That Transport Canada conduct, and reserve the right to conduct, pilot proficiency spot checks on all air carrier pilots, including designated company check pilots, as it sees fit and without notice.
- MCR 150** That Transport Canada conduct initial pilot proficiency checks and line checks with every air carrier in cases where a new aircraft type is being introduced, to ensure that the

required standards are met in that air carrier's operation of the new aircraft type.

- MCR 151** That Transport Canada ensure that all pilot proficiency checks on aircraft over 12,500 pounds and on all turbojet aircraft be conducted only by air carrier inspectors or company check pilots holding a current rating for the specific aircraft type on which the check is being conducted.
- MCR 152** That Transport Canada ensure that pilot proficiency checks on non-turbojet aircraft and on aircraft under 12,500 pounds be conducted only by air carrier inspectors or company check pilots who are type-rated on that aircraft type or on a generically similar aircraft.
- MCR 153** That Transport Canada develop a clear and unambiguous definition of "generically similar aircraft" to be placed in all applicable regulations and supporting manuals.
- MCR 154** That Transport Canada, on a priority basis, rewrite the conflict of interest section of its Air Carrier Check Pilot Manual so as to include the following objectives:
- (a) to provide a clear and unambiguous definition of what is meant by the term "conflict of interest" as it relates to company check pilots;
 - (b) to specify those areas in which a conflict of interest can arise, in addition to the area of financial interest.
- MCR 155** That Transport Canada provide explicit guidelines to its air carrier inspectors on the subject of conflict of interest for use in evaluating individual candidates for the position of company check pilot.
- MCR 156** That Transport Canada conduct an evaluation of potential conflict of interest with respect to each company check pilot candidate, and that a written record be kept of each such evaluation.

36 CONTRACTING OUT, WAIVERS, AND SPOT CHECKS

Contracting Out

In the years preceding economic deregulation, it was not usual for large air carriers with well-developed maintenance and flight operations departments to take on contract work from other carriers. However, with the advent of Economic Regulatory Reform (ERR) in the mid-1980s, contracting out of aircraft maintenance, flight training, and even flight dispatch/flight following services became a far more frequent occurrence. The pattern that Canada followed was similar, on a smaller scale, to that which had occurred in the United States. Mr Donald Douglas, formerly the director of Transport Canada's Licensing and Inspection Branch, described the Federal Aviation Administration's experience with deregulation as follows:

- A. On the airworthiness side, they were discovering that there were new methods of doing things. There was always a tendency to make cuts, if the bottom line was running the show, to the maintenance side.

If they didn't have a maintenance organization, they would be contracting out maintenance and doing new things that hadn't been common practice before. And this made it more difficult for the airworthiness people.

Contracting out might not necessarily even be in the United States. The maintenance might be done in another country, and this created more travel.

(Transcript, vol. 143, pp. 42-43)

The Canadian situation relative to contracting out, following the introduction of ERR, was touched on by Mr Henry Dyck, Transport Canada's airworthiness superintendent of large air carriers:

- A. ... We also had the big increase in contract maintenance being carried out outside the country in foreign repair stations, because the new entrants did not and could not put together maintenance facilities adequate to handle their work. The existing carriers in Canada couldn't handle the additional work,

so it was quite common to go outside the country to have aircraft maintained.

(Transcript, vol. 135, pp. 16–17)

There were two problems that Transport Canada experienced as a result of contracting out. The first related to a great deal of international travel for the Transport Canada inspectors. While the costs of such travel were borne by the air carrier, the travel consumed an inordinate amount of time in a period when Transport Canada was faced with escalating workloads and diminishing qualified and experienced staff. Mr Ian Umbach, Transport Canada's superintendent of air carrier operations (large aeroplanes), addressed this issue in his testimony:

Q. The contracting of maintenance and training, were you, as operations inspectors, facing the same problem of monitoring the airlines as a result of contracting out?

A. Yes.

Q. Can you describe that?

A. Frequently, the carrier would take training where he could find it, it could be in the States, it could be in the U.K., it could be at more than one location.

I recall one carrier, we had five inspectors simultaneously doing PPCs at five different simulators, and it placed enormous loads on our resources.

Q. And these five different simulators were located at different places in the world?

A. Different places in North America.

(Transcript, vol. 138, pp. 83–84)

The second problem with contracting out related to the absence of regulations and guidelines. It was not always clearly understood that the air carrier, not the contractor, was responsible for ensuring that the work or service met the appropriate Canadian standard. In some instances the air carrier did not have qualified personnel to provide such assurance.

In the early stages of ERR, there were no guidelines for Transport Canada inspectors applicable to their inspections of contractors' work or service. Guidelines were subsequently developed for airworthiness inspectors, but have not been enabled by regulation. Consequently, airworthiness inspectors at times found themselves in foreign countries assessing facilities and maintenance procedures that complied with the standards of that particular state. The inspectors would have little recourse but to use their own judgement in ensuring conformity with Canadian standards and hope that they were not challenged by the carrier or the contractor.

The problem is addressed in the Douglas Report, "Aviation Safety in a Changing Environment," as follows:

In recent years, certain practices among air carriers have changed, such as the degree to which air carriers contract out services. Present regulations do not appear to adequately address these new and complex practices. While the FAA continually reviews the adequacy of specific regulations, there is a need to perform a comprehensive analysis of the overall air carrier regulatory structure in the context of the changed airline operating environment. While this task will be large, actions of a more immediate nature are being taken to address these issues.

(Exhibit 1057, p. 5)

It should be noted that this statement was produced on May 28, 1986. While the intent of the statement is to be commended, evidence before this Commission shows that little was done in the years that followed. On November 17, 1990, Mr Umbach provided a page of recommendations to the Commission. One of these recommendations was, "Revise the Air Regulations and ANOs on a priority basis." When questioned about that recommendation during his testimony, he stated:

A. ... New trends are developing constantly.

Flight watch certification are inadequately addressed in current regulations. The present manuals, well, for flight watch, we don't have a manual. The certification manual isn't as specific as it should be to meet changing developments.

New practices are being entered into on a global scale now that we are, at the moment, ill-prepared to meet.

(Transcript, vol. 139, pp. 29-30)

Mr William Slaughter, director of flight standards, confirmed Mr Umbach's view when he was questioned on certain regulatory deficiencies requiring attention:

A. Yes, improve the regulations applicable to air carriers contracting maintenance, flight watch, et cetera.

I think we have seen in the last few days that there are areas of the regulations that need changing, significant changes, so I would have to support and agree on that.

(Transcript, vol. 146, pp. 190-91)

I support the recommendation by Mr Douglas for a comprehensive review of regulations to enable inspectors to respond in a timely manner to meet the demands of a changing airline operating environment. Such a review was needed in 1985 and it is still required today. The need for an overall safety regulation reform is dealt with in chapter 37 of this Report, Safety Management and the Transport Canada Organization.

Waivers

The *Aeronautics Act* gives the minister authority to grant exemptions or waivers to regulations and orders:

- (2) The Minister may, on such terms and conditions as the Minister deems necessary, exempt any person, aircraft, aerodrome, facility or service from the application of any regulation or order made under this Part if in the opinion of the Minister the exemption is in the public interest and is not likely to affect aviation safety.

(Aeronautics Act, c.33, s.5.9/2)

Authority has been granted to incumbents of certain positions in the Aviation Regulation Directorate to grant waivers to some specific regulations or orders: such positions are delineated in the relevant document. Where authority to grant such waivers is not enabled by a particular regulation or order, the director-general of aviation regulation has been delegated authority, on behalf of the minister, to grant such waivers and conditions as they pertain to his aviation regulation responsibilities. Mr Weldon Newton, who held the position of director-general, gave evidence on this issue:

- A. Where the legislation does not provide for an exemption, where the regulation doesn't say the words "unless otherwise authorized by the Minister," where the regulation contains a total prohibition "no person shall" or "everyone shall" do something ... to be in compliance, and no exempting circumstances contemplated by the wording, that the Minister has delegated that authority to me, to make one by one determinations.

(Transcript, vol. 161, p. 166)

In the course of his testimony, Mr Newton gave a good example of a carrier requesting relief from a regulation. On the evening of May 31, 1988, he received a phone call from a representative of Air Ontario who requested a waiver from the requirement to have floor track lighting installed in Air Ontario's HS-748 aircraft. The requirement stemmed in part from recommendations arising from the Air Canada DC-9 accident in Cincinnati in June 1983. Carriers were given two years to acquire and install floor track lighting. The effective compliance date of the requirement was June 1, 1988. The reason given for noncompliance by Air Ontario, according to Mr Newton, was that the company had intended to dispose of these aircraft prior to the compliance date of the regulation, but was unsuccessful in doing so. The request for a waiver was denied, a decision that, based on the evidence I heard, I fully support.

I cannot say the same for the decision made in the case of the seat-belt order, an issue that is discussed at some length in chapter 22 of this Report. In July 1987 a proposed amendment to Air Navigation Order Series II, No. 2, set out a requirement that every person on board an aircraft shall keep a safety-belt fastened when the safety-belt sign is illuminated. An exception to the order allows crew members to perform safety-related duties in other than the takeoff and landing phases of a flight while the seat-belt sign is illuminated. The carriers' representative, the Air Transport Association of Canada (ATAC), lobbied to have the exception include "other duties as approved by the captain" (Exhibit 1168, tab 5). The intent of the ATAC proposal was to enable meal and bar service to continue at the discretion of the captain after the seat-belt sign had been turned on. Transport Canada accepted the ATAC proposal.

The flight attendants' union, the Canadian Union of Public Employees (CUPE), vigorously intervened to have the order applied as it was written. Its concern was that accident statistics showed that cabin attendants had sustained injuries as a result of in-flight turbulence and that pilots were not always able to anticipate turbulence in sufficient time to warn cabin crew to take their seats.

The CUPE final submission to this Commission on the outcome of this dispute suggests that the evidence from Mr William Slaughter, director of flight standards, is "clear on the power of the regulated, namely the Air Transport Association of Canada, to regulate the conduct of the regulators" (Transcript, vol. 166, p. 46). In this instance, in spite of the advice and warnings of their own technical specialists, Transport Canada management acceded to air carrier influence and permitted meal and bar service to continue at the discretion of the captain while the seat-belt sign was illuminated.

If the regulators are to be given the latitude of judgement in applying the regulations, they should recognize that a waiver is a provision that is to be considered and granted only in the most exceptional circumstances and only after thorough technical advice has been obtained and considered. They should also be required to exercise the same prudence in determining the point at which industry consultation ceases to become consultation and becomes a lobby on behalf of a carrier.

Spot Checks or No-Notice Inspections

The use of spot checks or no-notice inspections was identified by numerous witnesses as an effective means of ensuring compliance with air carrier operating rules and as an essential element of the surveillance and monitoring process. Mr Slaughter testified that there is a place for

spot checks and that “the reason they aren’t used more often is simply because we don’t have the resources to do so.” He stated that spot checks are used for “any number of reasons” and cited an example:

- A. ... If there was some reason to suspect there was a problem in a particular area of a company, we might just go in and do a spot check on that item.

(Transcript, vol. 144, pp. 80–81)

The requirement for increased use of spot checks is recognized and supported as a means of ensuring that carriers are complying with the operating rules as a matter of standard every day practice and not just when regulatory authorities are on the premises conducting an audit.

Findings

- At the time of the hearings of this Commission, there were few definitive guidelines that set out the basis on which Transport Canada inspectors were to ensure that foreign contractors provided services that met Canadian standards.
- Transport Canada senior managers appeared in some instances to be most susceptible to industry demands to overturn safety-related regulatory amendments, in spite of advice to the contrary from their own Transport Canada technical specialists.
- No-notice inspections, although favoured by a number of witnesses as an effective means of ensuring regulatory compliance, were not often used owing to a lack of available inspector resources.

RECOMMENDATIONS

It is recommended:

- MCR 157** That Transport Canada provide appropriate regulations governing the practice whereby air carriers enter into contracts with other companies or agencies for the provision of facilities or services required under the terms of the air carrier’s operating certificate.

- MCR 158** That Transport Canada inspectors be provided clear and direct guidance governing their aviation-regulation responsibilities for approval of arrangements and facilities to be contracted out to other companies or agencies by Canadian air carriers.
- MCR 159** That Transport Canada set out a clear and unequivocal policy for senior managers specifying the basis upon which a waiver application is to be considered, ensuring that all safety implications are fully considered and satisfied before such waiver is granted.
- MCR 160** That Transport Canada take steps to increase substantially the number of no-notice inspections of air carriers, with particular emphasis on safety-sensitive or high-risk areas.

37 SAFETY MANAGEMENT AND THE TRANSPORT CANADA ORGANIZATION

The Problem

The lack of a designated agency within Transport Canada charged with the responsibility for overall coordination of safety-related aviation activities was considered in various phases of the Inquiry. This became a matter of particular concern during the presentation of evidence concerning lineups of aircraft at Toronto's Lester B. Pearson International Airport during adverse winter weather conditions that caused wing contamination and required ground de-icing of departing aircraft.

In the *Second Interim Report* of this Inquiry I concluded that the evidence clearly confirmed the existence of a safety problem at Pearson International Airport, a problem that may also exist to a lesser extent at other Canadian airports. The evidence that led to this conclusion brought to light a concern with respect to Transport Canada's ability to monitor, identify, and correct safety deficiencies in the Canadian air transportation infrastructure. During the Transport Canada phase of the hearings, further evidence was heard which indicated that organizational problems within Transport Canada may have contributed to this safety assurance deficiency.

My mandate did not specifically direct an examination of the Transport Canada organization; in my view, however, it would be irresponsible to ignore the safety implications of organizational deficiencies such as were highlighted during this Commission's examination of the highly relevant aircraft contamination and aircraft ground de-icing issues.

The De-icing Example at Pearson International Airport

The evidence of witnesses regarding aircraft lineups at Pearson International Airport during periods of freezing precipitation provides

explicit examples of the inability of the current Transport Canada establishment to identify, analyse, and deal with aviation safety issues in a coordinated manner. The three primary witnesses examined in that regard were Mr Clare Vasey, a unit operations specialist with the Airport Control Services at Pearson International, Mr John Holm, superintendent of air operations at Pearson International, and Dr Lloyd McCoomb, director-general of safety and technical services of Transport Canada.

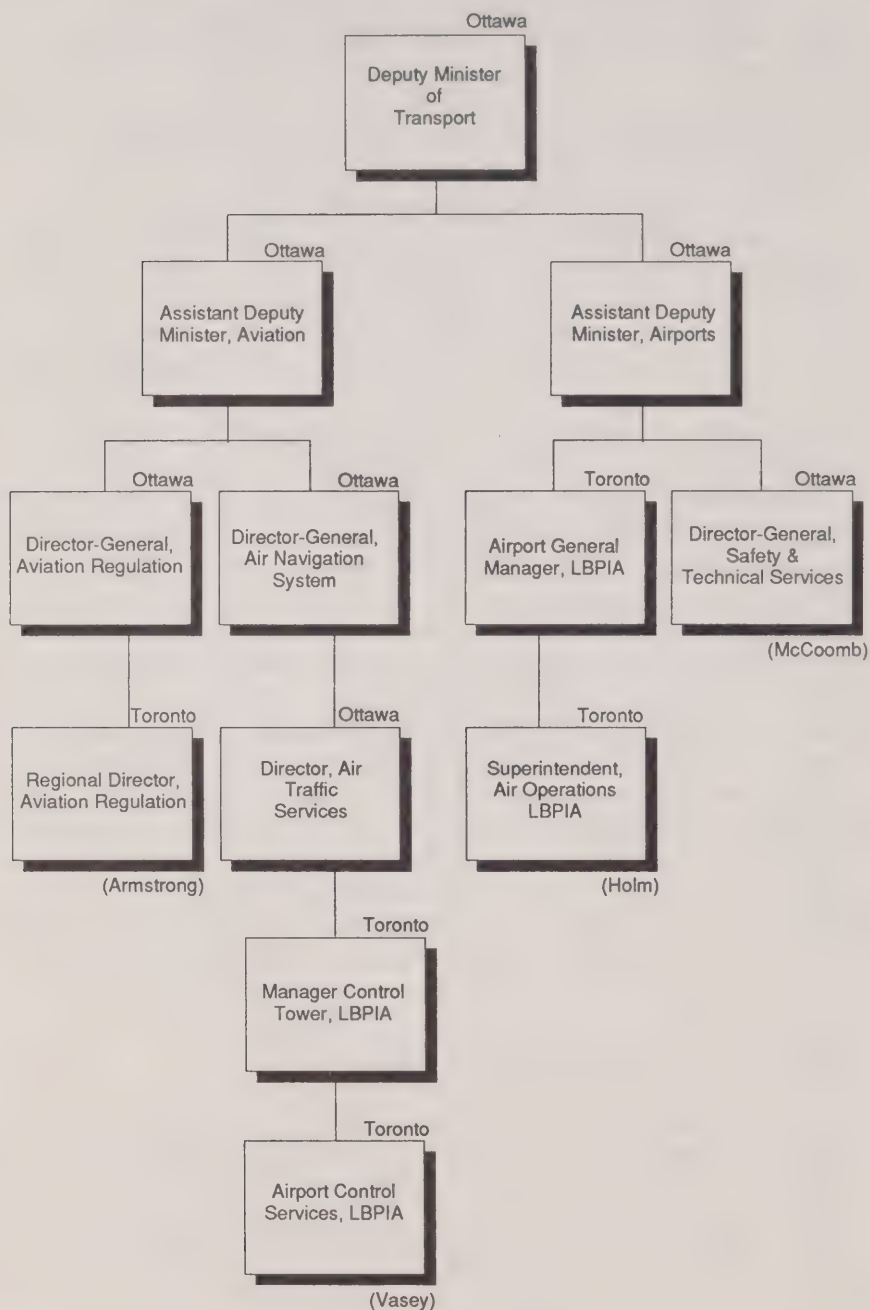
Mr Vasey described in detail the problems of ensuring that aircraft were capable of departing Pearson within a reasonable period of time after being de-iced. Mr Holm reiterated Mr Vasey's concerns about the safety aspects of lengthy takeoff delays after de-icing and testified that he had expressed them to the Transport Canada airport management at Pearson. Dr McCoomb gave the opinion that the safety aspects of aircraft de-icing are the responsibility of the air carrier in the first instance and that Transport Canada's Aviation Regulation Directorate has the responsibility of monitoring airline operations to ensure that aircraft do not depart in an unsafe condition. Mr Ronald Armstrong, Ontario Region's director of aviation regulation, later testified that he had not been made aware of any problems of aviation safety associated with such conditions at Pearson.

The evidence reflects the views of these four witnesses on a specific aviation safety-related problem as well as the differences of opinion as to whether in fact a problem existed and, if it did exist, how it should have been addressed. The fact that the problem was not universally recognized and addressed demonstrates a serious lack of communication and direction at appropriate levels of management in Transport Canada. Mr Holm made reference to two on-site committees he chaired at Pearson, the Civil Aeronautics Committee and the Airside Committee, before which some concerns on the subject were raised. The facts indicate, however, that these committees were ineffective either in gaining full recognition of the problems or in pursuing resolution to the necessary level.

The Problem Resolution Chain

It is not difficult to understand how such lack of communication and direction occurs when the reporting relationship of the four witnesses in question is examined. Figure 37-1 is designed to show that reporting relationship; it is not presented as an official organization chart. It demonstrates, however, that each of the witnesses reported through different channels and that there was no coordinating authority in the region.

Figure 37-1 Transport Canada: Reporting Relationships



* Depicts selected relationships

Figure 37-1 illustrates the following significant points:

- Mr Vasey was aware of the operational problems at Pearson International Airport in conditions of adverse winter weather. His line reporting chain was to his superior, who in turn reported directly to the Ottawa office of the director, air traffic services, which reported to the assistant deputy minister, aviation, who reported to the deputy minister. Air Traffic Services, however, was not responsible for regulation of flight operations.
- Mr Holm recognized the problems. He reported them to his superior, who said they were airline problems. The airport general manager was responsible to the assistant deputy minister, airports, in Ottawa, who in turn reported to the deputy minister.
- Dr McCoomb, who was located in Ottawa, was responsible as director-general, safety and technical services, for policy regarding certain safety aspects at airports. He reported to the assistant deputy minister, airports, but was not in the line reporting relationship with the airport general manager at Pearson. He was not aware of the problems.
- Mr Armstrong, who was located in Toronto, was responsible for aviation regulation monitoring and enforcement in the Ontario Region. He stated that he was not aware of the problems.

Even if each of the four witnesses had been fully aware of the problem at Pearson and had sought direction for a resolution, the first level of authority at which Mr Armstrong's and Mr Vasey's views would have come together would have been that of the assistant deputy minister, aviation, in Ottawa. The first level at which Mr Holm's and Dr McCoomb's concerns would have been heard together would have been that of the assistant deputy minister, airports. The first level at which authority over all four of these areas of responsibility existed would have been that of the deputy minister.

It is in my view unacceptable and not in the interest of aviation safety that Transport Canada allowed such a segregated organizational approach to management of the aviation system to exist.

Background

The Canadian Air Transportation Administration (CATA) after 1982

The report of the Dubin Commission of Inquiry on Aviation Safety was published in 1981–82 following an exhaustive investigation spread over

two years. The report was critical of CATA's inability to enforce regulations and of its organizational mix of responsibilities for aviation regulation and air navigation services. The recommendations of that inquiry resulted in the consolidation of air navigation services under a single directorate in CATA headquarters and the establishment of an enforcement branch. Similar changes were made in the organization of each of CATA's six regions in that each region was directed by a regional administrator to whom the three major operational directors – air navigation services, aviation regulation (including enforcement branch), and airports – reported. That organizational structure provided a central authority in each region responsible for coordinating the activities of the three major functions, including safety-related problems, particularly those that cut across the areas of responsibility of the three functions. Similarly, aviation safety problems of a national or international nature could be dealt with by direction from the CATA headquarters administrator.

The Present Organization (1985–April 1, 1991)

In 1985–86 a major reorganization took place in which CATA was disbanded and separate Airports and Aviation groups were formed. The positions of the CATA administrator and those of the six regional administrators disappeared. The regional directors of air navigation services, aviation regulation, and airports now reported directly and separately to the individual Ottawa headquarters office responsible for their particular function.

This organizational change facilitated centralization of authority and the elimination of some managerial levels. The change, however, also eliminated the regional structure that had previously provided a common Transport Canada aviation response to aviation industry concerns and to safety-related aviation problems. The most significant result of this 1985–86 organizational change was that the office of the deputy minister of transport at that time became the first level at which there was overall authority over the activities of the three groups.

Problems Inherent in the Present Organization

The Management Consulting Services Branch of Transport Canada in 1990 prepared an organizational change proposal for the Aviation Group (Project Number 1682-342 dated January 1991). A copy of that document, provided to this Inquiry, outlines organizational problems within Transport Canada caused by centralization and as perceived by its staff and client groups:

ORGANIZATIONAL CHANGE PROPOSAL AVIATION GROUP

B. BACKGROUND.

...

Management of the Aviation Group has become highly centralized. The objectives of centralization included achieving economies of scale, and overcoming an autonomous approach to regional management which was evident in the previous CATA organization. That approach had resulted in inconsistent application of national standards, policies and procedures. However, management centralization brought its own set of problems.

C. CURRENT PROBLEMS IN THE AVIATION GROUP.

MEMBERS OF THE AVIATION COMMUNITY HAVE OBSERVED THAT IT APPEARS THE DEPARTMENT IS ORGANIZED TO MEET ITS INTERNAL NEEDS RATHER THAN THE NEEDS OF ITS CLIENTS. Two problems most frequently cited were:

- clients are forced to coordinate participation of several TC branches to resolve aviation (ANS), IFR, airports problems, and
- clients encounter delays in the delivery of the regional regulatory program because of procedural problems and the requirements for HQ approvals.

A number of regional managers and staff expressed concern regarding the increasing tendency for the aviation community to bypass regions and deal directly with HQ, to resolve problems or obtain approvals, undermining the credibility and sense of commitment of regional officials.

The Aviation community suggests that improvements are needed in the Aviation Group's approach to consultation: the process should be structured, and undertaken in the problem definition phase, rather than after the solution has been developed.

THE FOLLOWING PROBLEMS WERE IDENTIFIED BY MANAGERS AND STAFF IN THE AVIATION GROUP:

- The Aviation Group does not operate as a team. Problems requiring system-wide solutions are not resolved in a timely manner (eg, de-icing, noise abatement, environmental issues).
- The compartmentalized structure of Aviation in HQ and regions discourages a Group approach to establishing priorities and leveraging resources.

- The senior management forum in the Aviation Group comprises only HQ managers representing both functional and operational issues. The Regional Managers, who actually deliver aviation services, have no direct input to decisions in the Assistant Deputy Minister, Aviation's (ADMA) management forum.
- The [Air Navigation Services] ANS directorate, comprising 80% of Group resources, has not been successful in managing within its resource envelope. Part of this problem is due to the political difficulty of changing levels of service; a management culture that historically viewed additional resources as the sole solution to all problems also has made cost containment difficult.
- The Executive Director of Technical Services, with a span-of-control of 15, manages a capital program of nearly \$250 million, which includes three MCPs [major crown projects]. Management layers in the ANS directorate do not permit compliance with Chapter 545 of the Treasury Board (TB) Administration Policy Manual (APM) which states that MCP project managers should be no more than two management layers below the Deputy Head.
- The Aviation Safety Programs activity has undergone an extensive review recently, and there is a need to clarify its external and internal responsibilities.
- There are as many as seven layers of management between the point of service delivery and ADMA. Layers are not only expensive, but they dilute accountability and filter information. Layers diminish ADMA's influence on service delivery.

The problems identified in the organizational change proposal are those that led to what I view as a fragmented approach to resolution of safety issues. The centralization of control at headquarters effectively reduced regional capability to deal with safety issues in a direct and coordinated manner. The many layers of management between regional branches, where the real work of inspection is done, and senior headquarters management created a gap in communications and a lack of understanding of existing problems.

Safety Assurance Issues

Although the de-icing situation at Pearson International Airport discussed above is the issue most relevant to conditions existing at the time of the Dryden accident, there is other evidence as to the inappropri-

ateness of the present organization to the provision of thorough aviation safety assurance.

Audit Organization

The effectiveness of air carrier audits in assuring aviation safety is addressed in chapters 32 and 33 of this Report. Although various opinions were expressed in evidence by Transport Canada witnesses as to the safety effectiveness of audits relative to other types of monitoring and surveillance, it is evident that there is a requirement for thorough and timely audits. However, Transport Canada has no established organizational structure that provides dedicated resources for the conduct of audits. The 1988 audit of Air Ontario is an example of the inadequacies of the present Transport Canada organization to provide that service. The convening authority who was located in headquarters in Ottawa appointed the audit manager, also from headquarters in Ottawa. Members of the audit teams, including the team leaders, were solicited from various regions. The audit manager did not have full control over the inspection staff provided for the audit. As a consequence, it was conducted in a poorly organized, incomplete, and ineffective manner.

If the convening authority, the audit manager, and the team leaders do not have dedicated personnel under their full control and authority, they cannot be expected to conduct a high quality audit.

Resource Allocation Process

Chapter 31, Aviation Regulation: Resourcing Process, deals at length with the inadequacies of the Transport Canada resource identification and allocation process. The cumbersome system of challenge and re-challenge for justification of requirements described by numerous witnesses was an example of the unwieldiness of the process and the organization itself. The evidence showed that the managers were unduly burdened with the extra justification paperwork, even though they already suffered from insufficient resources.

The staffing standard provided to the Aviation Regulation organization was particularly important to the inspector staff of the sections responsible for air carrier inspection both in the Airworthiness and Air Operations sectors. The estimation of the times required to perform their tasks and the frequency with which those tasks were to be performed was derived through an exhaustive challenge system, as described by Mr Armstrong in his testimony. The estimates of those frequencies and times were challenged again at each level of management, finally receiving the approval of the assistant deputy minister, review. The

resulting staffing standards were verified by a non-partisan review conducted by McGill University. The regional headquarters and Ottawa headquarters managers responsible for inspection services rightfully believed that the figures they put forward using such formulae represented the minimum numbers of persons required on their inspection staff to conduct the vital aviation safety inspection services required of them. Yet throughout this Inquiry, many witnesses testified that those recommended levels had never been provided.

The failure of Transport Canada to provide the number of persons that the aviation regulation program clearly required in the absence of any program modification is an anomaly that is patently unacceptable. In the earlier CATA organization, the regional administrator and the headquarters administrator had a one-on-one relationship, with regional perspectives and concerns being communicated directly to the administrator. The organization that came into effect in 1985–86 separated the assistant deputy minister from his regional directors, interjected resource management review levels, and deprived regions of direct access to plead their case and impress on the assistant deputy minister the serious implications of the lack of resources. As a result, the senior management levels within Transport Canada became unrealistically separated from the problems in the regions and the seriousness of the failure to deliver an aviation safety-related program.

Management Hindrance: Line-Manager Levels

The reorganization that took place in 1985–86 resulted in the allocation of person-years being made by the headquarters directors-general to individual directors and in the removal of all flexibility from regions in the disposition of the allotted resources. Under the previous CATA organization, regional administrators controlled and were accountable for all person-years relative to air navigation services, aviation regulations, and airports, and the financial resources provided to their region. If in their wisdom there was a requirement to direct utilization of resources temporarily to an area where aviation safety or other urgent demand required, the regional administrators had the power to do so. Within a reasonable length of time they were expected to correct that situation through the routine administrative process. In the meantime, the urgent situation could be managed by reallocating resources within the region. The system facilitated responsible and accountable management at the appropriate level.

The Management Consultant Services study mentioned above stated that one of the purposes of the 1985–86 reorganization was “overcoming an autonomous approach to regional management which was evident in the previous CATA organization. That approach had resulted in

inconsistent application of national standards, policies and procedures." Surely correction of ineffective or inconsistent management should have been pursued through counselling and direction rather than through a reorganization that centralized authority and discouraged managerial accountability at the program delivery level.

This lack of regionally centralized management authority resulted in underutilization of person-years in some branches, while other branches that could have used the excess person-years were not authorized to do so. Mr Fernand Mousseau, Aviation Group's director-general of the Policy Planning and Resource Development Directorate, during his testimony illustrated the misinterpretation that could be taken from such under-utilization. He maintained that the Aviation Regulation Directorate could not recruit the people to fill their allotment. The implication was that the lack of inspectors was not affected by allocation levels but by availability of qualified candidates. The evidence indicates, however, that managers were restricted in their pursuit of candidates because of limits on allocation levels. It is my view from the evidence that they were further restricted in their ability to staff their organization because of lack of managerial flexibility and by bureaucratic misunderstanding or obstinacy at the resource management and allocation levels.

Management Hindrance: Senior Levels

Within the Aviation Group, the assistant deputy minister, aviation, was responsible for putting forward the fully justified requirements for person-years for the Air Navigation and Aviation Regulation directorates. Problems in this area were outlined by Mr David Wightman, assistant deputy minister, aviation, Mr Claude LaFrance, former assistant deputy minister, aviation, and Mr Weldon Newton, director-general, Aviation Regulation Directorate. The assistant deputy minister, aviation, having been assigned a specific allotment of person-years, had some flexibility in assigning those person-years to these two major directorates. He was not entirely free, however, to allocate them to the most safety-effective groups. For example, Mr LaFrance testified that he was of the opinion there were certain navigational facilities that could be closed without affecting the safety of the system. The savings in person-years from those facilities could have been allocated to aviation regulation, thereby increasing their surveillance and monitoring capability. When such proposals were put forward they were frequently rejected: the political influences that come to bear on such decisions will be understood. The result, however, was an inability to direct resources to the most safety-critical areas.

It is difficult to understand how a reorganization of this nature could have been allowed to come into effect in 1986 considering that the

implementation of the recommendations of the Dubin Inquiry were only being completed about that time. The very principles of organization that had been recommended by that inquiry appear to have been violated in the attempts to centralize the organization with more control at headquarters. It was counterproductive for the senior management of Transport Canada to have approved an organization so ill-designed to ensure accountability for the taking of immediate and appropriate action to address serious aviation safety issues.

Transport Canada Safety Awareness

On July 5, 1970, an accident involving an Air Canada DC-8 occurred at Toronto International Airport, Malton, Ontario. One hundred and nine lives were lost in the crash of that aircraft. Mr Justice H.F. Gibson was subsequently appointed to conduct an inquiry to determine the causes of the accident.

Mr Justice Gibson determined that the captain had adopted a procedure concerning the operation of the aircraft spoilers that was contrary to that specified in the Air Canada DC-8 operating manual. Confusion arising out of this noncompliance with the manual resulted in the first officer inadvertently deploying the spoilers while the aircraft was about 60 feet above the runway during the landing flare. This premature deployment of the spoilers set in motion a sequence of events that led to the crash. Evidence presented to the Gibson Inquiry indicated that it was common practice among certain Air Canada pilots to follow a procedure concerning the arming and deployment of the spoilers that was contrary to the Air Canada DC-8 operating manual. Further evidence indicated that some Air Canada check pilots did not insist that certain Air Canada pilots adhere strictly to the operating procedures prescribed in Air Canada's DC-8 operating manual. It appears that one recommendation made by Mr Justice Gibson was designed to prevent such unauthorized practice from developing in future. That recommendation reads as follows: "Consideration should be given by the Ministry of Transport to strengthening its capability of monitoring flight procedures of Canadian air passengers carriers."¹ It is noteworthy that this recommendation is one of only eight made by Mr Justice Gibson and that the report is dated January 1971.

The director (now director-general) of aviation safety is assigned a role of promoting aviation safety through, among other things, participation in the organization of aviation safety education. I believe there is a clear

¹ "Report of the Board of Inquiry into the Accident at Toronto International Airport, Malton, Ontario, to Air Canada DC8-CF-TIW Aircraft on July 5, 1970," p. 111

need for such an educational program to be conducted within the senior offices of the groups responsible for aviation within Transport Canada.

Various reports on aviation accidents, inquiries, and investigations have produced findings and recommendations that have, over the years, been aimed at the adoption of policies designed to improve aviation safety. The Gibson and Dubin reports are but two examples. It seems logical that the Aviation Safety Directorate should be charged with the responsibility to review these reports and documents, to consolidate the findings and recommendations, to track the implementation of such recommendations, and to design and conduct an aviation safety course for all senior managers of Transport Canada aviation programs to familiarize them with respect thereto.

Overall Safety Management

The assistant deputy minister, aviation, Mr Wightman, stated emphatically in his testimony that it was his office that was responsible for overall aviation safety. I find his "buck stops here" attitude most admirable. The question remains, however, on what basis can Mr Wightman make this assertion. The evidence indicates that his concept of singular responsibility for aviation safety management is not held by all management members of Transport Canada, nor is it clearly stated in the policy documents or position descriptions. Questions remain as to the aviation safety responsibilities of the Aviation and Airports groups, the extent to which aviation safety levels can be assured through the regulatory process, and how safety effectiveness can be measured.

Responsibility for Safety

Although the *Aeronautics Act* is not specific in its assignment to the minister of responsibility for aviation safety, the role statements for the Airports and Aviation groups clearly include such responsibility. Indeed, most of the position descriptions of witnesses who appeared before this Commission, whether senior public servants, line managers, or inspectors, included definite statements of responsibility to participate in the assurance of aviation safety. The evidence of these witnesses when they were questioned indicated that each was quite conscious of such responsibility.

At the practical level at Transport Canada, however, there is no organization responsible for overall aviation safety and management of the department, and each organization at Transport Canada pursues its individual safety goals. Many of the witnesses expressed a preference for a separate office or agency responsible for the identification of aviation

safety issues, and with the authority to direct the actions of the relevant groups to resolve such issues.

The Inspector-General, Transportation Safety

The title of this position would seem to indicate that the appointed incumbent would hold the responsibility for and the authority to address the overall safety issues of Transport Canada. Such is not the case, however.

In the course of the hearings, Mr Ronald Armstrong, Ontario Region's director of aviation regulation, was questioned about the role of the inspector-general, transportation safety. A copy of the job description indicated, as did Mr Armstrong in his evidence, that the position would be responsible to investigate and advise the deputy minister regarding safety issues on a case-by-case basis for all three transportation modes: air, surface, and marine. It is obvious that the position could not be held accountable for overall aviation safety management of the department, particularly since the staff of the inspector-general consisted of a total of only five people to address all three modes of transportation.

I have been made aware that, as of October 1, 1990, the position of inspector-general, transportation safety, no longer reports directly to the deputy minister of transport but has been incorporated into the organization of the assistant deputy minister, review. There is no indication that the change in reporting relationship entails additional responsibilities or authority that will contribute to the improvement in coordination and direction of response to safety-related issues. In fact, the lowering in reporting level would seem to indicate the reverse.

Aviation Safety Programs: Transport Canada

The Aviation Safety Programs Branch of the Transport Canada Aviation Group reports directly to the assistant deputy minister, aviation. The title of that branch may give the impression that this organization is responsible for overall safety assurance in the Aviation Group. Such is not the case. The primary function of the branch is to enhance aviation safety through the promotion of safety education programs and to analyse aviation safety data for the information and action of the assistant deputy minister, aviation. The organizational change proposal mentioned above (Project 1682-342) proposes an extension of the responsibilities of the branch to include monitoring the overall Transport Canada Aviation Group system, including regulatory and air navigation branch activities related to safety. It also proposes the retitling of the organization to System Safety.

Although this organization change is an attempt to address a missing systems approach to safety through a clear assignment of such responsi-

bility to a particular directorate, it still does not address or include any safety issues that might affect airports or the Airports Group.

In summary, it appears that the various directorates are cognizant of their safety responsibilities. The Airports organization recognizes its responsibility to ensure that airport facilities meet reasonable safety standards; the Air Navigation organization is consciously responsible for providing safe services in the form of navigational aids, en route and terminal facilities, and air traffic control; the regulatory organization contributes to safety through ensuring compliance by the industry with the regulations and orders. It appears that all the functions and activities necessary to address aviation safety have been considered and assigned to these agencies. Missing, however, is an organizational structure with the positive control and authority necessary to direct a coordinated and practical aviation safety management program.

Transportation Safety Board of Canada

The mandate of the Transportation Safety Board is broad in scope. However, it does not extend to participation in the internal review or monitoring of Transport Canada in its role of providing assurance of aviation safety.

Enforcement and Education

In the latter stages of the hearings there was considerable discussion on the virtues of education as an effective means to enhance aviation safety. The report prepared by the consultant firm James F. Hickling in 1990 on aviation regulation and safety programs was critical of Transport Canada for spending too much energy on minor violations that were of little safety consequence, while not enough effort was being put into overall education and safety promotion.

Mr Wightman, assistant deputy minister, aviation, supports the need for increased emphasis on safety promotion and education and, accordingly, has increased both the stature and resources of his safety promotion organization. In his testimony before this Inquiry on January 22, 1991, he indicated that, in his view, there was good safety value to be obtained from such an investment. He also expressed a conviction that these initiatives would not be achieved at the expense of the surveillance and compliance/enforcement organization:

- A. ... I just wanted to conclude by saying that in increasing the emphasis on safety programs, safety educational programs and promotional activities, we are not going to take those resources from the Enforcement group to do that. We will find them

elsewhere and the Enforcement activity will continue.

(Transcript, vol. 166, p. 74)

I fully support the notion that safety promotion and education is an effective way to enhance aviation safety. I believe little benefit can be obtained from enforcing minor first-occurrence documentary and administrative violations to the full extent of the law. The imposition of licence suspensions and fines for these kinds of occurrences in all probability detracts from the promotion of a positive compliance attitude. Having so stated, I would urge the government to provide sufficient resources to Transport Canada's Aviation Group to ensure that the aviation community, and in particular the air carrier industry, is effectively monitored to comply with essential safety regulations and standards. Where noncompliance is detected, effective action must be taken by an appropriately staffed and trained enforcement organization. Aviation education and safety promotion should most definitely not be enhanced at the expense of surveillance and enforcement.

Safety Assurance Effectiveness

Safety Assurance Effectiveness of Aviation Regulation

Evidence before this Inquiry with regard to assessment of the effectiveness of aviation regulation in achieving aviation safety does not provide any conclusive and quantitative result. There is agreement that the monitoring of the industry for conformance with aviation regulations and orders does have a positive effect on assuring some degree of safety. The inspection, approvals, and licensing activities of aviation regulation assure minimum standards that contribute to an overall acceptable level of safety. There are, however, no sound detailed data and analysis available that will quantitatively demonstrate the effectiveness of regulatory activity in the prevention of accidents and incidents. The absence of such a formula leads to subjective analysis based on the experience and judgement of the senior review personnel such as those participating in the challenge procedure associated with the resource acquisition process as outlined in chapter 31, *Aviation Regulation: Resourcing Process*. The evidence indicates there is a significant gap in perception between incumbents of these senior positions and the operating regulators as to the safety effectiveness to be achieved by performance of various types and frequencies of regulatory activity. The result, of course, is the continual denial or return of resource submissions by the senior review committees, as described by Mr Claude LaFrance (see chapter 31).

The evidence indicates that a staffing formula known as ARASS, a refinement of the A-base review outlined in chapter 28, Conditions at Transport Canada, Early 1980s, was based initially on the considered input of the inspectors who conduct the actual inspection. Following detailed examination and dialogue at that level, the system was further reviewed by, and received the approval of, their supervisors, the relevant branch managers, directors, and directors-general of aviation regulation, as well as the assistant deputy minister of aviation. Development of that standard yielded agreement on the various tasks to be performed by aviation regulation and the frequencies at which they should be conducted in order to monitor adequately the safe performance of the aviation industry.

It would, of course, be of great value and convenience to have a clear-cut formula based on sound data and scientific analysis that would indicate conclusively the exact effect to be expected on aviation safety with each additional person-year assigned to the aviation regulation program. Such a system would be of particular value to departmental reviewing officers with little or no knowledge or experience of aviation on which to base their judgement.

The evidence indicates that the aviation regulation organization has given serious and sound consideration to development of the tasks and their appropriate frequencies necessary to achieve its stated regulatory objectives. These considerations appear to have been based on the best available data. Until more suitable and practical measurement systems evolve, it can be assumed that the methods adopted by the aviation regulation organization will assure an acceptable contribution to the overall level of safety, provided the program is properly directed, supported with the necessary resources, and monitored appropriately.

Safety Assurance Effectiveness Measurement Methods

The foregoing section of this chapter recognizes an ongoing need for improved methods of assessing the effective influence of various regulatory activities on aviation safety. Such improved methods should continually be sought in attempts to obtain the best results with available resources and in the establishment of task priorities. In order to achieve those aims, it is necessary to examine the factors influencing the achievement of aviation safety and to identify and define indicators to be used in measuring the effectiveness of those factors.

Numerous studies have been conducted by Transport Canada, by various consulting agencies, and by the United States Federal Aviation Administration (FAA) in attempts to identify and define such safety measurement indicators. One of the more recent studies was conducted

by Sypher-Mueller International Ltd, as part of an evaluation of the contribution of aviation safety regulation and aviation safety programs to aviation safety in Canada (Exhibit 1316). That study was successful in identifying a list of optimal indicators and proposed a model that could be developed to provide improved methods of analysing and assessing acceptable safety levels. The report also concluded, however, that deficiencies exist in the data-gathering process and that these deficiencies must be overcome prior to realization of significant progress in such analysis and assessments.

The FAA has expended considerable effort in the development and use of aviation safety measurement indicators, and the Aviation Safety Programs Branch of Transport Canada is cooperating with that agency towards further development in that regard. Although research and development of such safety measurement indicators and data collection process systems are expensive and onerous, the eventual values would appear to be significant.

During this Inquiry we have seen examples of the variations in opinion as to the effectiveness of different types of surveillance and regulatory activity in achieving aviation safety assurance. The advances and changes to be anticipated in the dynamic aviation industry dictate use of scientific and practical methods of assuring that scarce resources are directed to the most safety-effective issues and activities. It is encouraging to note that Transport Canada is now cooperating with authorities in the United States in such a worthwhile effort.

Future Management and Organizational Structure

Following the hearings, the Inquiry was provided with a copy of a Transport Canada news release announcing organizational changes within the Aviation Group effective April 1, 1991. A copy of that news release is reprinted below. The information provided in that news release consists of a simple outline and is not intended to describe fully the change in organization. Nevertheless, some comments are warranted regarding the proposed organizational structure's ability to resolve the type of safety issues discussed in Part Five of this Report.

With the changes indicated by that announcement, it appears that Mr Wightman, as the current assistant deputy minister, aviation, has attempted to rectify the situation to some degree. Each of the regions will now have a director-general, aviation, who will have overall control of both the air navigation services and aviation regulation in their region. The reorganization also provides a direct reporting relationship for those directors-general to Mr Wightman. The revised organization

will facilitate better communication between the air navigation and regulatory directorates and will provide a structure suited to prompt resolution of safety problems affecting those two areas of responsibility.

The Airports Authority Group (Airports Group), however, is not included in the reorganization. I have seen no evidence of an attempt to put Airports Group under a similar organizational umbrella, thereby assuring con-solidated response to aviation industry concerns and needs, nor any evidence that indicates there are measures to address the safety issues affecting the activities of both the Airports and the Aviation groups of Transport Canada. The measures taken, therefore, seem to be incomplete: they reflect Mr Wightman's enthusiasm within his specific areas of jurisdiction, but do not address cross-group issues such as the de-icing concerns addressed in my *Second Interim Report*.

This new organization will provide the regional directors-general with better access to the assistant deputy minister, aviation. It can be assumed that they will therefore have a better opportunity to express their concerns and provide direct communication regarding the need for resources and the establishment of priorities in the conduct of their duties associated with program delivery.

This reorganization applies to the Aviation Group only and does not, therefore, entail any changes outside this group such as the resource allocation process. I have concern that these important aspects have not been considered and that such organizational change was directed to only one group, Aviation Group, when the department's area of aviation responsibility in fact includes the current Airports Group. Accordingly, the reorganization should be re-examined, but at the departmental level rather than the Aviation Group level.

Transport Canada News Release

Annex A to Section H
(H.5.4)

Part 12

No. 53/91 For release
April 5, 1991

NEW REGIONAL DIRECTORS GENERAL NAMED TO TRANSPORT CANADA AVIATION

OTTAWA – Six Transport Canada directors have been promoted by the Public Service Commission to the position of regional director general in Transport Canada Aviation.

Robert W. M. Corbett of Moncton, N.B., is the Atlantic regional director general, aviation; André D. Perez of Montreal is the Quebec

regional director general; and Ronald I. Coulas of Toronto is the Ontario regional director general.

Frank M. Murphy of Winnipeg is the Central regional director general; Donald J. Douglas of Vancouver moves to Edmonton to become the Western regional director general; and David J.R. Larrigan of Vancouver is the Pacific regional director general.

Corbett, Perez, Murphy and Larrigan are former regional directors, aviation regulation; Coulas and Douglas are former regional directors, air navigation services.

The appointments are the result of a recent reorganization which calls for directors general to administer the department's aviation programs in each of the six regions across the country.

The reorganization has eliminated the positions of regional director, aviation regulation and air navigation system, and has assigned these functions to the new regional directors general. Each new director general has increased authority and responsibilities for air traffic control and the monitoring and evaluation of system safety.

All Instrument Flight Rules air traffic control staff now report to the regional director general instead of Transport Canada Aviation headquarters in Ottawa. This decentralization move is in keeping with the federal government's Public Service 2000 policies which encourage the delegation of authority to managers who are closer to the clients they serve.

The six regional directors general also have additional responsibilities for system safety. New resources are being allocated in Transport Canada Aviation to improve the way safety deficiencies in the national civil air transportation system are identified, analyzed and evaluated.

Aviation safety-education programs will be continued but with more emphasis on the acquisition and evaluation of "safety-deficiency data" as well as monitoring and consultation with the aviation industry.

Transport Canada Aviation is the new name for Transport Canada's Aviation Group.

Contact: Ron Armstrong
Aviation, Ottawa

Findings

- The *Aeronautics Act* itself is not specific in its delineation of aviation safety responsibility. Nevertheless, the *raison d'être* of the Transport Canada organization is to provide an aviation safety net.
- Throughout the Transport Canada phase of the Inquiry, I was, for the most part, impressed by the dedication of Transport Canada witnesses

at all levels, from the inspectors involved in day-to-day regulatory activity through to very senior managers. The critical conclusions that can be drawn relate to a lack of mutual understanding of the restrictions placed on various levels of management through enforced economies and the unprecedented increase in aviation-related activity in the latter half of the 1980s.

- Because of resource constraints, an inadequate regulatory framework, and organizational deficiencies, the present Transport Canada organization is ill-equipped to provide in an efficient manner a uniform level of safety. The existence of distinctly separated line reporting relationships to the top of the organization appears to foster rather than discourage fragmentation of management philosophy and activity. The apparent inability of the Air Navigation, Aviation Regulation, and Airports groups to work together in identifying and addressing aviation safety issues is troublesome.
- The segregated organizational structure within Transport Canada Aviation Group precludes any direct contact between regions and the assistant deputy ministers, and provides little opportunity for regional managers to influence the decisions of senior management and agencies such as Management Review Board in order to ensure that regional resource requirements are properly addressed.
- The evidence provided graphic examples of the problems faced by those charged with the responsibility of completing audits, inspections, certification programs, and other regulatory and surveillance functions, but who were not provided the resources so to do.
- The inability of lower and middle management to relay emphatically the safety concerns caused by such resource shortages to the most senior management of Transport Canada is, in my view, an abrogation of responsibility attributable to lack of effective organization and the inaccessibility of senior management. This basic problem hinders all aspects of the Aviation Group safety program.
- Compared with the system that existed under the CATA organization, managers in the regions now have little control over the allocation of resources to high-priority safety items. They are now restricted to specific allotments and are limited by staffing restrictions such as freezes and inflexibility of policy.
- The Aviation Group conducts audits on the industry to assure conformance with the *Aeronautics Act* and its regulations and orders.

- Although the Transport Canada organization has been studied and restudied, there seems to be an absence of will to review such studies and to implement programs that will effectively address genuine safety concerns.
- Considering all of the evidence, I find it difficult to understand why the April 1, 1991, reorganization left the Airports Group separated from the Aviation Group in the area of safety responsibility. The news release announcing these changes indicates that the new directors-general of aviation in each region will have "increased authority and responsibility for air traffic control and the monitoring and evaluation of system safety." The authority and responsibility do not extend to the positive action that is required to address safety problems identified and analysed in the "monitoring and evaluation process."
- The absence of such authority limits the ability of the regional directors-general to address such safety aspects unless they fall entirely within the purview of Air Navigation systems and/or Aviation Regulation; they have no authority over the Airports program.
- The evidence, particularly as it related to aircraft de-icing, demonstrated the weakness in an organization that does not provide clearly stated overall authority and responsibility for coordination of safety activities. Accountability cannot be expected unless it is supported by the necessary authority and responsibility.
- It would be erroneous to conclude that the organizational change of April 1991 will address the shortcomings which this Inquiry has uncovered regarding inattention to aviation safety management issues that cross both the Airports and Aviation groups' lines of responsibility. That will in all probability not occur unless a senior position in each region is made responsible for the functions of both of those groups and, similarly, unless a senior aviation position becomes responsible for the headquarters aspects of those functions as well as for line authority over the six regional senior positions. It appears that such an arrangement could be achieved with a reduction rather than an increase in numbers of senior positions.
- It is time that Transport Canada address lack of coordination of safety activities among its various aviation groups rather than proposing reorganizational attempts that go halfway towards proper safety supervision and responsibility.

- There is ample evidence before this Commission to show that Transport Canada, because of a variety of inadequacies in its organization, has fallen short of meeting its safety assurance responsibilities. Much of the evidence indicates that competition for scarce resources, both within the department itself and with other departments, has been a basic contributing factor to such inadequacy.
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RECOMMENDATIONS

It is recommended:

- MCR 161 That Transport Canada proffer for enactment an amendment to the *Aeronautics Act* to delineate clearly the minister's responsibility for aviation safety. Such amendment should emphasize the minister's responsibility to ensure that the department is organized in a manner to keep the minister accurately informed of the ability of Transport Canada to deliver its mandated aviation safety programs effectively.
- MCR 162 That Transport Canada be organized in a manner to provide the managerial structure necessary to keep the minister and deputy minister fully and accurately informed of all matters having an impact on aviation safety, and to ensure that appropriate and timely action is taken to address aviation safety concerns.
- MCR 163 That Transport Canada state clearly the goals that aviation safety-related programs are expected to achieve, and that it identify the extent of inspection, surveillance, and enforcement activities that must be conducted within a given time frame. Such program goals should be designed in consultation with the Aviation Group's operationally and technically qualified staff.
- MCR 164 That Transport Canada create a single position in each region (e.g., a director-general) responsible and accountable for the delivery of the aviation programs assigned to the present Airports Authority Group and the Aviation Group. This position should report directly to a senior administrator or assistant deputy minister at headquarters, who is responsible

for the overall delivery of such aviation programs on a national basis.

- MCR 165 That the regional directors-general (proposed in MCR 164 above) be authorized to manage their resources in a responsible and flexible manner. Such authority should be accompanied by firm insistence on accountability and a monitoring activity that will ensure responsible management.
- MCR 166 That Transport Canada create the position of a headquarters' operational aviation safety officer with an appropriate support staff. This aviation safety officer should report directly to the most senior aviation position in the department and should be responsible for auditing the safety performance of both the Airports Authority Group and the Aviation Group.
- MCR 167 That Transport Canada actively participate in the research and development necessary to establish safety effectiveness measurement systems that will lead to the most efficient use of resources in assuring safety. Cooperation with the United States Federal Aviation Administration and other international groups should be encouraged and resourced to obtain the maximum and most expedient benefits from such programs.
- MCR 168 That Transport Canada aviation safety committees, with access directly to the headquarters' operational aviation safety officer, be established in regions and headquarters.
- MCR 169 That Transport Canada establish a mandatory education program to ensure that senior managers and officials of the department who are responsible for or associated with aviation programs are aware of the basis for and requirement to support policies that affect aviation safety.

PART SEVEN

HUMAN FACTORS

38 CREW INFORMATION

Flight Crew

Captain George Morwood



George John Morwood: captain,
C-FONF

Age: 52

Date of birth: March 27, 1936

Pilot licence: Airline Transport Pilot
Licence YZA-001128

Pilot medical expiry: September 1, 1989

Total flying time: 24,100.00 hours

Total flying time F-28: 82 hours

Total jet experience: 673 hours (591
hours on Gulfstream II)

Total flying time last 90 days: 130 hours

Total flying time on aircraft type last 90
days: 80 hours

On duty March 10, 1989, prior to
occurrence: 5.4 hours (approximate)

Off duty prior to March 10, 1989,
work period: 14.5 hours (approximate)

Flying Background

Captain Morwood began flight training in Toronto in September 1953 with Central Airways, located on Toronto Island, and obtained a private pilot licence in January 1954. He then enrolled in a course for commercial pilots and received his licence in January 1955. After training, he achieved a flight instructor rating in May 1955 and commenced work for Central Airways as an instructor. He obtained an instrument rating in 1961 and continued to instruct and to fly charters for Central Airways until 1967. He accumulated over 12,000 hours flying for this company. Of this total, approximately 550 hours were on multi-engine aircraft. He then took a similar position with Millardair based at Lester B. Pearson

International Airport and flew there for about one year, accumulating a further 500 hours multi-engine experience on larger aircraft.

Captain Morwood joined Transport Canada as an air carrier inspector, conducting instrument rides and pilot proficiency checks on pilots located in the Ontario Region. He continued in this position until September 1970, when he joined Denison Mines as a pilot on a Grumman Gulfstream GII turbojet aircraft. This aircraft is similar in appearance to an F-28, and each is equipped with Rolls-Royce RB183 Mark 555-15 engines, more commonly known as Rolls-Royce Spey. Although the Grumman Gulfstream GII aircraft is lighter than the F-28, it has similar operational speeds and design characteristics, such as a hard wing, that is, a wing with no movable lift-generating device on the leading edge. Captain Morwood did his recurrent flight training on a GII flight simulator with Flight Safety Inc., and the records of his instrument rides indicate that his performance was consistently above average on this jet aircraft.

Captain Morwood joined Great Lakes Airlines, the forerunner to Air Ontario, in 1973. He was trained on a Convair 440 aircraft and upgraded to a Convair 580 turboprop aircraft in 1974. By 1988 he was an experienced airline transport pilot, having accumulated over 9000 hours on the Convair 580. Further, he had acquired management experience, having served as a company check pilot on the CV580 as well as chief pilot from 1978 to 1980.

In January and February 1988 Captain Morwood successfully completed the Piedmont Airlines F-28 ground school and simulator training. He completed his pilot proficiency check, and his licence was endorsed for the F-28 aircraft on February 26, 1988. After this training Captain Morwood went back to flying a Convair 580 aircraft for the remainder of 1988.

The company received its second F-28 aircraft in December 1988, and thereafter Captain Morwood attended a Piedmont F-28 Pilot's Recurrent Ground School, which consisted of 16 hours of classroom instruction and a written examination that he passed with 99 points out of a possible 100. Captain Morwood completed eight hours of recurrent F-28 simulator training and thereafter passed a proficiency check on January 9, 1989. He carried out his line indoctrination training and route check between January 18 and January 25, 1989, accumulating a total of 27.5 hours of line flying.

Captain Morwood's work schedule for the four months prior to the crash was examined and was not considered arduous. In the month of March he had worked six days and had three days off prior to the accident. All of Captain Morwood's flight schedules met the requirements for duty time limitations set out in the Air Navigation Orders.

Captain Morwood filed 40 company incident reports that the Commission is aware of during his employment with Air Ontario Inc. and Great Lakes Airlines. The reports were recovered in part from Air Ontario Inc., with the remainder coming from Captain Morwood's personal files. Many of the reports as filed involve occurrences that could affect the safe continued operation of an aircraft and provide an insight into the extent of his professional experience and knowledge.

A review of several representative incident reports demonstrates clearly that Captain Morwood had an established record of making sound decisions concerning the operation of an aircraft. He viewed these reports as a valuable source of information that could be used by company management and fellow employees to enhance the efficiency and safety of the operation. He was willing to file incident reports, even when not required to do so, and was able to accept full responsibility for any errors or omissions on his part.

A number of documents that belonged to Captain Morwood were recovered in the wreckage of the aircraft on March 10, 1989. It is curious that some of these documents dated back to 1979. Of particular interest was a letter of January 11, 1983, to Captain Morwood from Captain Robert Murray, director of flight operations at the time, on the subject of de-icing.

Aviation Management Experience

A compilation of 373 bulletins concerning a wide range of operational and administrative matters and primarily authored by Captain Morwood in the period 1977-80 was reviewed. A sample listing of some of the bulletins he produced during this period shows that he was providing both guidance and authoritative direction to the Great Lakes Airlines flight crews under his direction.

After reviewing these bulletins and other evidence, Mr David Rohrer testified before the Commission:

- A. A review of Captain Morwood's Air Ontario personal file, training file, and Department of Transport file indicate Captain Morwood consistently maintained a high standard during his pilot proficiency checks on various aircraft.

Captain Morwood was generally described by many pilots who flew with him as an assertive Captain who was safety conscious and cautious. The company flight safety incident reports filed by Captain Morwood generally support this description of him.

(Transcript, vol. 87, p. 110)

Captain Erik Hansen, an Air Ontario pilot, added to this description, based on his long association with Captain Morwood that began more than 20 years before the accident:

Q. What was your overall impression of Morwood as a pilot?

A. He was a proverbial instructor. He never shut up. And ... to him, there was no other way but to teach. He was just checking and checking and checking.

That's why I think a lot of the first officers we had – and captains too, for that matter – really didn't like flying with George too much. It was not because of his – it was just that you always felt you were on a check ride.

It took the, shall we say, the fun out of flying or the enjoyment out of doing a trip, because George was always on your case, asking you questions and crossing all the T's, dotting all the I's and all that good stuff in the log book. That was George.

...

But, other than that, like I say, I've known George for twenty-some odd years.

Q. From the way you knew Morwood, sir, can you see a first officer getting under his skin by telling him what to do?

A. No.

Q. How would he react to that?

A. Well, George would tolerate it to a certain extent, but I don't think George would ... let them get under his skin, as such. George would put him in his place. You wouldn't be in doubt as to who was in charge when you were flying with George.

Q. He was the boss?

A. He was the boss.

(Transcript, vol. 94, pp. 101–103)

A. He would always be concerned about the people in the back, are the people getting a nice ride or if it gets bumpy.

He would always be on the chimes, again George on the chimes, get the girls up front, tell everybody to buckle down. He may see a cloud 25 or 50 miles ahead and he says, maybe get a little bumpy, he says, you better get everybody strapped down and you get the coffee out of the way and pick up all the cups. And that would be George, concerned with passengers.

Whereas, you know, other pilots might be saying, well, you know, it may get bumpy, it may not.

Let's wait for the first bump before we do anything, kind of thing.

Q. That was not his style?

A. No, not George.

(Transcript, vol. 94, pp. 143–44)

Q Really, I want to come to my final area of questioning now, Captain. Everything we've heard about George Morwood is that ... he was a very careful, cautious pilot, maybe a little condescending from time to time to first officers, he was a born teacher, but he was a by-the-book kind of guy, and he was – he erred on the side of being a conservatively safe pilot.

Does that synopsis of George Morwood coincide with your own impression of the man?

A. That is correct, pretty well.

(Transcript, vol. 94, pp. 166–67)

Captain Morwood's Takeoff Limits

In order to determine Captain Morwood's takeoff visibility limit for the Dryden airport, it is necessary to refer to the Air Ontario Flight Operations Manual (FOM), the Canada Air Pilot (CAP), and the Air Regulations.

The Air Ontario FOM stipulates that:

a) Standard Take-Off Weather Minima

All take-offs must be carried out in weather conditions that are at, or better than, those published in the Canada Air Pilot, Jeppeson [sic], US National Oceanic and Atmospheric Administration, Company Approach Procedures manuals or Operations Specifications amendments as applicable.

(Air Ontario Flight Operations Manual,
p. 6-5, s. 6.5.2 IFR Flights)

Operating specifications are contained in the operating certificate of an air carrier. A copy of the operating certificate with amendments is contained in the air carrier's FOM. Amendment No. 8 to Air Ontario Operations Specifications allows F-28 takeoffs where the reported visibility is RVR (runway visual range) 1200 feet (one-quarter mile) or more. One of the conditions for applicability is that the pilot-in-command (PIC) have at least 100 hours of PIC experience on the aircraft type.

The Air Ontario FOM continues:

Exception

If the take-off limits are lower than the published landing limits for the landing runway(s) at that airport, the take-off may be made provided that you have a take-off alternate meeting the requirements of ANO V, No. 8 within 60 minutes flying time on one engine in still air.

(Ibid. p. 6-5)

The FOM specifies the takeoff and landing limits that apply for new pilots-in-command as follows:

a) New Pilots-in-Command (Captains)

Until the Captain has achieved 100 hours on type, the ceiling and visibility will be increased one hundred (100) feet and one-half ($\frac{1}{2}$) mile respectively, above the limits published in the Canada Air Pilot/Jeppeson, Foreign Approach Manual, or approved Company approach procedures manual.

(Ibid., p. 6-9, s.6.6 Specific Limits)

This requirement is in accordance with a Transport Canada policy.

According to the airport chart page in the Canada Air Pilot, the takeoff visibility minima for the Dryden Municipal Airport effective March 9, 1989, were one-half mile for both runway 29 and runway 11.

The lowest published landing ceiling and visibility data for the Dryden airport, effective December 15, 1988, and in effect on March 10, 1989, are for the instrument landing system (ILS) approach to runway 11. Although technically these data are not limiting, they are treated as limits by Air Ontario (FOM, p. 6-9, s.6.6). The limits are a decision height of 1554 feet above sea level, which equates to a cloud ceiling of 200 feet above ground level, and three-quarters of a mile visibility.

Air Regulation 554 reads in part as follows:

- (1) The Minister may establish standard procedures for air operations at specific aerodromes, which procedures may be published in a document entitled the *Canada Air Pilot*.
- (2) The instrument approach procedures established under subsection (1) shall specify and authorize
 - (a) the minimum altitudes to which a pilot-in-command may descend during an approach to a landing;
 - (b) the minimum visibility in which any pilot-in-command may conduct a landing or a take-off.

Air Regulation 555 defines the takeoff visibility for a runway as

- (a) the RVR [runway visual range] of the runway, unless the RVR is
 - (i) fluctuating ...
 - (ii) ... a localized phenomenon
 - (iii) not reported ...
- (b) the ground visibility of the aerodrome for the runway, if
 - (i) the RVR is as described in subparagraph (a) ... and

- (ii) the ground visibility of the aerodrome is reported as set out in the definition "ground visibility";¹ or
- (c) the visibility for the runway as observed by the pilot-in-command, if
 - (i) the RVR is as described in subparagraph (a) ... and
 - (ii) the ground visibility of the aerodrome is not reported as described in subparagraph (b)(ii).

The RVR was not reported at Dryden on March 10, 1989, and since the ground visibility of the airport was reported, paragraph (b) above applies. As stated in chapter 4 of this Report, the reported ground visibility for the Dryden airport at 12:00 noon CST was two-and-a-half miles and at 12:06 p.m. it was three-eighths of a mile. Because the ground visibility is reported at Dryden airport, a pilot-in-command must use the reported ground visibility as the takeoff visibility.

On March 10, 1989, Captain Morwood had fewer than 100 hours as pilot-in-command on the F-28 aircraft. Accordingly, he was governed by the limits as published in the Canada Air Pilot and not by the takeoff visibility as in Amendment No. 8 to Air Ontario Operations Specifications, and he had to add 100 feet and one-half of a mile to the applicable published takeoff and landing limits.

The published takeoff visibility limit for Dryden is one-half of a mile, which is less than the lowest landing visibility limit of three-quarters of a mile; therefore, three-quarters of a mile applies. Because he was required to add one-half of a mile to the published limit, Captain Morwood's visibility limit for takeoff from Dryden was one-and-one-quarter miles unless he filed a takeoff alternate.

If Captain Morwood had filed a takeoff alternate, the Exception referred to above would have applied and his takeoff visibility limit

¹ "Ground visibility," in respect of an aerodrome, means the visibility at that aerodrome as contained in a weather observation reported by

- (a) an air traffic control unit,
- (b) a flight service station,
- (c) a community aerodrome radio station operated under the control and supervision of the territorial government of the Northwest Territories or the Yukon Territory,
- (d) a COMMET station, or
- (e) a radio station that is ground based and operated by an air carrier.

(Air Regulations, p. 7)

The weather facility at the Dryden Municipal Airport was operated under contract with the minister of the environment. The weather observations made at Dryden were available through normal Environment Canada weather services to any of the above agencies.

would have been one mile. There is no evidence, however, that a takeoff alternate was filed.

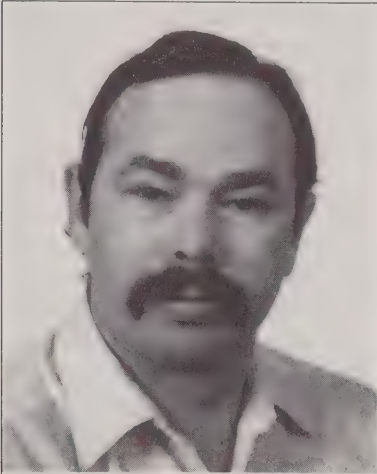
Personal Profile

Captain Morwood was in good health. He was approachable, friendly, and well liked by his fellow workers. He was regarded within the company as somewhat of a father figure. He was a conservative, religious, and fastidious person and was generally viewed as being part of the "old school." It was the fastidious side of his nature that led to the only potentially negative comments that were made about him. He was a punctual man who disliked being late and who felt almost an exaggerated sense of contractual obligation to his passengers. In an interview, Mr Kothbauer, duty manager of Air Ontario's system operations control, stated: "If he [Captain Morwood] thinks you're going to inconvenience his passengers, you know, it's almost like a personal insult to him."

Captain Morwood was not a man who was easily intimidated. In one incident, he submitted a letter to Air Ontario management pointing out what he believed to be a safety deficiency in a particular aircraft. When Air Ontario management did not respond to his concerns, he sent a copy of his letter to the regional director of aviation regulation of Transport Canada. In general, however, Captain Morwood was reported as being happy with Air Ontario, happy with the F-28, and not contemplating any change in employment.

Approximately 14 months prior to the accident, Captain Morwood separated from his wife of 29 years. He was not initially happy with the separation, but, in time, he met someone else and was engaged to be married. In the six months prior to the accident he was described by everyone interviewed as being happier than they had seen him of late. His relationship with his wife was amicable and their financial separation was complete. Captain Morwood maintained a good relationship with his children and was, in fact, sharing an apartment with one of his daughters. He was financially secure, and he and his fiancée had purchased a block of land and were in the process of planning to build a house. Captain Morwood did not smoke and drank alcohol very moderately.

First Officer Keith Mills



Keith Benjamin Mills: first officer,
C-FONF

Age: 35

Date of birth: February 24, 1954

Pilot licence: Airline Transport Pilot

Licence YZA-143579

Pilot medical expiry: July 1, 1989

Total flying time: 10,000 hours plus

Total flying time F-28: 66 hours

Total jet experience: 3500 hours Cessna

Citation (estimated)

Total flying time last 90 days: 93 hours

Total flying time on aircraft type last
90 days: 66 hours

On duty March 10, 1989, prior to
occurrence: 5.4 hours (approximate)

Off duty prior to March 10, 1989, work
period: 14.5 hours (approximate)

Flying Background

First Officer Mills began flying in 1973 and obtained a private pilot licence in 1974 from Peninsula Air Service in Hamilton. He enrolled in the commercial pilot course and obtained that licence in 1975 from the same company. He flew commercially for various companies, and was also a flying instructor for a parachuting school in Toronto.

In May 1979 First Officer Mills was employed by Austin Airways Ltd as a Twin Otter co-pilot for its northern operations. He became a captain in the Twin Otter aircraft and flew in this capacity until 1982. He moved to the air ambulance division of the company, where he flew the Cessna Citation aircraft, a light twin-engine jet with a gross takeoff weight of less than 12,500 pounds. He also flew the Cessna 402 aircraft and other small twin-engine piston-powered aircraft. After he qualified for Transport Canada's "A" and "B" authority as a company check pilot, he was authorized to conduct pilot proficiency checks and instrument rating renewals, as well as to carry out company line indoctrination and pilot route checks on both aircraft types. The air ambulance operation was administered through a contract with the Ontario government and often required short-notice flights under less-than-favourable weather conditions into remote settlements throughout the province.

First Officer Mills moved to Thunder Bay in February 1987 and flew a Twin Otter on an Air Ontario subcontract for Bell Canada, but the contract was cancelled in January 1988. He then trained on the Hawker

Siddeley HS-748 turboprop aircraft. He attended the Canadian Airlines International Limited initial pilot ground school on the HS-748 turboprop aircraft from January 11 to 22, 1988, and obtained a 96 per cent average. He successfully completed his initial company aircraft training and initial Transport Canada pilot proficiency check as a captain between January 25, 1988, and February 1, 1988. In February 1988 he was promoted captain on the HS-748. Between February 5 and February 29, 1988, Captain Mills was successful in completing his initial line indoctrination, accumulating 57.5 hours of line flying before assuming line flying duties as a captain. The base in Thunder Bay was subsequently closed and Air Ontario sold the HS-748 aircraft to another carrier. In late 1988 he applied to be first officer on the F-28, based in Toronto, and was awarded that position. In January 1989 he attended the F-28 ground school in Winston-Salem, North Carolina, conducted by USAir. His flight training on the F-28 aircraft began in February 1989, and he successfully completed a pilot proficiency check ride on February 10, 1989, exactly one month before the Dryden crash. First Officer Mills did not take any F-28 simulator training because time on the simulator was fully booked. He received his flight training in the F-28 aircraft. His instructor was Captain Joseph Deluce and the training was carried out in four flights from Winnipeg airport. All of these training flights were carried out late at night, when the aircraft were not being used in revenue flights.

First Officer Mills flew for Austin Airways and then Air Ontario for a total of 10 years. He was known as an assertive pilot who could be abrasive at times. His schedule in the four-month period preceding the accident was not unusual and all schedules were within the duty time limitations contained in the Air Navigation Orders.

First Officer Mills's flying abilities, as documented by his initial training, his recurrent training, and proficiency checks carried out by Transport Canada and company check pilots, were satisfactory. However, in reviewing his records, it was apparent he had from time to time experienced some difficulties, as set out hereunder.

In his first attempt to obtain a class I instrument rating, the inspector terminated the ride and provided the following reasons:

Applicant experienced difficulty right from start, YYY VOR off the air so he set up for V361 using London VOR – Flying erratic – x-[cross] check poor – holding at KF poor – no wind assessment – ADF approach barely acceptable – Timed turns poor – ILS entry and procedures OK up to Marker then Localizer steering became poor – Back Crs [course] again OK until Final then Localizer steering became very poor – ride terminated!

(Exhibit 690)

First Officer Mills passed a reride test a short time later.

During and following his HS-748 training, First Officer Mills was involved in three reported incidents involving the HS-748 aircraft. On February 23, 1988, during the course of his initial line indoctrination with Captain Ross Woods, an engine overtemperature occurred in the aircraft during a takeoff from Thunder Bay. The takeoff attempt was aborted and the aircraft remained in Thunder Bay. An inspection of the aircraft revealed that the left engine plug covers had not been removed prior to the flight, resulting in an engine overtemperature condition that required the engine to be replaced. Captain Woods had carried out the walkaround and evidently neglected to remove the left engine plugs. Since First Officer Mills had not completed his training, Captain Woods would have been captain of this flight.

The second incident involving Captain Mills occurred on May 15, 1988, at Marathon, Ontario. The investigation of this incident by the Canadian Aviation Safety Board (CASB) determined that the aircraft was high on final approach and did not touch down until it was a considerable distance down the runway. The aircraft could not be stopped on the runway and it ran off the end to a distance of approximately 300 feet. The incident occurred when Captain Mills had 150 hours on type and while the first officer was flying the aircraft. In this occurrence, Captain Mills apparently failed to recognize that a go-around should have been initiated before touchdown and failed to take appropriate action.

As a result of the company investigation of this overrun on landing, Captain Mills was required to undergo a flight check. When this flight check was conducted, Captain Mills's performance proved to be unsatisfactory. He was then required to undergo an additional 50 hours of line indoctrination with a company check pilot. Captain Ross Woods, who was the captain mentioned in the first HS-748 incident referred to above, was assigned as the pilot to carry out this extra flying training with Captain Mills. Captain Mills demonstrated a lack of proficiency in handling the aircraft on approaches and landings. These difficulties, explained in notes taken by Captain Woods at the time, indicated problems that I find somewhat surprising in a pilot who appeared to have had no serious problems on his initial line training and who had already flown 150 hours as captain on the HS-748. In any event, Captain Woods recommended and the company required an additional 50 hours of line indoctrination, the latter portion of which was conducted by Captain Peter Hill.

Captain Mills's flying performance indicated considerable improvement after the second 50 hours and a check ride was carried out by Captain Larry Raymond on a three-day trip on July 20, 21, and 22, 1988. Captain Raymond considered the ride to be satisfactory and his report stated: "He had just completed an additional 100+ hours line indoc with

Captains Hill and Woods and appears to have absorbed and learned much from this extra training.”

Mr David Rohrer, the CASB operations group chairman, commented as follows:

Q. And you’ve noted here that the accident occurred when he had 150 hours on type, and while the First Officer was flying the aircraft.

Could you explain the next sentence:

“Captain Mills failed to recognize that a go-around should have been initiated before touchdown. As a result he was returned to the line for further indoctrination. He completed another 100 hours of line indoctrination with company check pilots and was again released as a Captain on the HS748.”

Just explain to us what that means?

A. Well, as a result of this occurrence, the company reviewed Captain Mills’ performance and elected, at that time, to give him further line indoctrination in the amount of 100 hours.

This is basically flying the airplane in his role as Captain under supervision of a check pilot.

Q. From your experience, sir, would the 100 hours that he did, is that high or low or is that average when you put a pilot back on further training?

A. Well, I suppose as a sense of comparison, the line indoctrination Captain Morwood did as a captain on the F-28 was 25 hours. The line indoctrination that First Officer Mills did was 20.

Now –

Q. That’s on the F-28?

A. On the F-28. Now, Captain Mills on the HS748s had already been line indoctrinated once and this was an additional 100 hours, which was about four times more than what a normal captain would receive.

Q. In your opinion, is that high?

A. Yes.

Q. In your opinion, is that demonstrative of anything?

A. Well, it indicates that he had some difficulties transitioning to that aircraft.

(Transcript, vol. 87, pp. 117–19)

The third incident involving Captain Mills occurred at Detour Lake on November 17, 1988. While he was taxiing the aircraft onto the runway in preparation for takeoff the right main landing gear settled in a soft spot off the prepared area. During the initial attempt to free the aircraft using its own power, the propeller was damaged by rocks that were thrown up by the propeller itself. Shortly after this incident the company sold the HS-748 aircraft fleet. Captain Mills applied to be first officer on the F-28 aircraft, and he commenced his training in January 1989.

With regard to these three incidents, it should be noted that they all occurred on the largest aircraft First Officer Mills had flown up to that date and in a relatively short span of time before he had acquired a significant amount of experience on the aircraft.

The record of pilot proficiency checks flown by First Officer Mills indicated some recurring problems with stall recovery on various aircraft types. Mr Randy Pitcher, civil aviation inspector in Transport Canada's Ontario Region, noted on one occasion when First Officer Mills was flying, the F-28: "Lost 200 feet because he allowed the nose to drop a little during recovery."

Personal Profile

First Officer Mills was 35 years old, married, and had one child. He had worked for Austin Airways Ltd and Air Ontario Inc. for 10 years. Interviews with company personnel portrayed him as an assertive individual who could be abrasive at times.

It is reported that First Officer Mills drank very little and did not smoke. He was in excellent physical condition, he worked out at the local gymnasium, and he played golf. In his youth he had been a successful athlete and had been drafted to play professional hockey.

First Officer Mills was apparently happy with Air Ontario and had no plans for changing employment. He was also happy with the F-28, but, according to his wife, he felt that his F-28 training had been a "little rushed."

Cabin Crew

Cabin Attendant Katherine Say



Katherine Lea Say: purser

Age: 31

Date of birth: November 30, 1957

Initial F-28 emergency procedures
training completed: December 1, 1988

First-aid training completed:
July 1, 1987

Fire-fighting training completed:
November 1, 1988

Cabin attendant Say's work schedule for the four-month period preceding the accident complied with all crew rest restrictions in place on March 10, 1989.

Although Mrs Say had not originally been scheduled to fly on the F-28 aircraft between March 6 and 10, 1989, the manager of in-flight services, Mrs Ruthe-Anne Conyngham, assigned her to these flights to review and organize the F-28 trolley carts and cabin service. Mrs Say was given these duties in her supervisory capacity as an in-flight coordinator.

Cabin Crew Training

Air Navigation Order Series VII, No. 2, part V, section 42(5), requires an air carrier to "submit to the Director for approval, a detailed training syllabus for each crew member classification." Mrs Say was properly qualified and trained to perform her assigned duties as the purser cabin attendant on Air Ontario F-28 aircraft in accordance with existing company requirements as approved by Transport Canada. She had successfully completed her mandatory initial F-28 training in December 1988 and had obtained both current and valid first-aid and fire-fighting training prior to her assigned duties on the F-28. She was considered to be a qualified and experienced cabin attendant and was deemed competent by both her superiors and her peers.

Cabin Attendant Sonia Hartwick



Sonia Victoria Hartwick: cabin attendant
Age: 26 (on March 10, 1989)
Date of birth: January 24, 1963
Initial F-28 emergency procedures
training completed: October 14, 1988
First-aid training completed:
September 1, 1986
Fire-fighting training completed:
October 1, 1988

Cabin attendant Hartwick's work schedule for the four-month period preceding the accident complied with all crew rest restrictions.

Cabin Crew Training

Mrs Hartwick was properly qualified and trained to perform her assigned duties as a cabin attendant on the Air Ontario F-28 aircraft in accordance with existing company requirements as approved by Transport Canada. She had successfully completed her mandatory initial F-28 training in October 1988 and had completed both first-aid and fire-fighting training prior to her assignment on the F-28 aircraft.

Mrs Hartwick had been employed by Air Ontario Inc. and one of its corporate predecessors, Air Ontario Limited, for two years and six months prior to the accident. She was considered to be a capable employee and was well liked by her superiors and peers. Although she was generally pleased with her duties as a cabin attendant, she had previously expressed reservations about the level of training she had received on other aircraft types in the company fleet. She had raised this concern in a memorandum to the manager of in-flight services, Mrs Conyngham, who, in response, assured her that she was a capable and dedicated cabin attendant who had been adequately trained for her position. Mrs Hartwick enjoyed her duties on the F-28 aircraft and had a good working relationship with Mrs Say. Mrs Hartwick's observations on her training at Air Ontario are further elaborated in chapter 20, F-28 Program: Flight Operations Training.

Crew Flight and Duty Times

ANO Series VII, No. 2, Part IV, sections 38 to 41, specify a number of crew-member requirements, including those that are common to both flight crew and cabin crew. A perusal of Part IV discloses an anomaly in the regulations regarding crew flight duty times. Section 41.1 requires an air carrier to set up a system that "establishes a maximum flight time, maximum flight duty time and a minimum rest period" for the air carrier's flight crew members for each 24-hour period. Section 41.1 also establishes a maximum flight duty time for a flight crew member of "15 hours in any period of 24 consecutive hours."² While maximum flight times and maximum flight duty times as well as minimum rest periods are specified in this section for flight crew members, there are no similar requirements in the ANOs for cabin crew members. The reasons for this distinction are not obvious.

Crew fatigue is one issue that must be addressed from the human performance perspective of aircraft accident investigation. Evidence as to the flight times and flight duty times worked by the air crew prior to an accident is relevant to this issue. The flight time and flight duty time

² Exhibit 308, ANO Series VII, No. 2, Standards and Procedures for Air Carriers Using Large Aeroplanes, section 41.1(1)(5), pp. 12 and 12-A.

records of all of the aircraft crew members of C-FONF were examined by the human performance investigators for this Commission.

The Commission investigators determined that the maximum flight times and maximum flight duty times of the flight crew of C-FONF on March 10, 1989, were in fact well within the limits set for flight crew in Part IV of ANO Series VII, No. 2. In the case of the cabin attendants of C-FONF, because there are no similar flight time and flight duty time limitations prescribed for cabin crew in ANO Series VII, No. 2, it is not possible to make such a comparison.

However, it can be said that the flight time and the flight duty time records of both of the cabin attendants on C-FONF in the week prior to the March 10, 1989, crash did not exceed the total times recorded by the flight crew members of C-FONF.

Findings

- The maximum flight times and maximum flight duty times of the flight crew of C-FONF on March 10, 1989, were within the limits set for flight crew in Part IV of ANO Series VII, No. 2.
- There are no maximum flight time and maximum flight duty time limitations prescribed for cabin crew in ANO Series VII, No. 2.
- The flight times and flight duty times of the cabin attendants on C-FONF on March 10, 1989, did not exceed the total times recorded by the flight crew members of C-FONF.

RECOMMENDATION

It is recommended:

- MCR 170** That Transport Canada address the anomaly existing in Air Navigation Order Series VII, No. 2, with respect to the lack of maximum flight times and maximum flight duty times prescribed for cabin crew members.

CREW COORDINATION AND THE COMMUNICATION OF SAFETY CONCERNS BY PASSENGERS

A number of individuals aboard flight 1363 were aware of an increasing buildup of contamination on the wings of the F-28 as it sat on the ramp at Dryden and as it taxied out in preparation for its fateful takeoff. Included in this group were the two flight attendants for flight 1363, Mrs Katherine Say and Mrs Sonia Hartwick, and two highly experienced professional pilots, Captain Murray Haines, an Air Canada DC-9 captain with 12,000 flying hours, and Captain David Berezuk, an Air Ontario de Havilland Dash-8 captain with 10,000 flying hours. Both of these pilots were travelling as passengers aboard the F-28, together with their families.

The question that was asked repeatedly during the Commission hearings, when it became clear that many of the passengers were concerned about the buildup of snow on the wings and recognized the potential for catastrophic results if a takeoff was attempted, was why did someone not bring this concern to Captain Morwood's attention. Yet, except for unsuccessful efforts by a Royal Canadian Mounted Police special constable, no one aboard flight 1363 made any attempt to check with the captain to see if he was aware of the contaminated condition of the aircraft wings.

The reasons for this apparent reluctance to bring to Captain Morwood's attention the condition of the wings, in the face of perceived danger, can be culled from the testimony of some of the survivors. Expert evidence was called in an attempt to rationalize the hesitance of Mrs Say, Mrs Hartwick, Captain Haines, and Captain Berezuk to speak to Captain Morwood regarding the wing contamination. Mr David Adams, chairman of the Commission's human factors group, and Dr Robert L. Helmreich, professor of psychology at the University of Texas and a social psychologist employed by NASA in the selection program

for astronaut candidates, gave evidence relative to the human factors and human performance aspects of the Dryden accident that may have had a bearing on the events of March 10, 1989.

The Evidence

Mrs Hartwick felt some concern about the presence of snow on the wings immediately after the passenger door to the aircraft was closed in preparation for departure. She testified she observed snow while the aircraft was in front of the terminal building and explained how she believed at the time that the aircraft would possibly be de-iced. Mrs Hartwick further testified that while walking through the cabin of the aircraft, after the door had been closed, she overheard passengers' concerns about the snow on the wings, some indicating they hoped it would blow off.

After the pre-takeoff cabin check was completed by the two flight attendants, they stood at the back of the aircraft as it taxied away from the ramp, only to be delayed short of the active runway while waiting for the Cessna 150 to land. Mrs Hartwick testified that thoughts of the Gander crash came to her mind and she was, at this time, becoming more apprehensive over the snow-covered condition of the wings. The snow was now starting to build up and a concern about the contaminated condition of the wings, and what the crew intended to do about it, was raised directly with the flight attendants by a passenger seated at the back of the aircraft. The passenger was Special Constable Dennis Swift of the RCMP, who was seated in aisle seat 13C.

Both Constable Swift and Mrs Hartwick testified before me in relation to this conversation about Constable Swift's concerns. He was a seasoned air traveller who had some knowledge of the theory of flight. He had an understanding that contamination adhering to a wing was capable of disrupting the lift-generating properties of the wing. Mrs Hartwick's evidence about that conversation is illuminating:

- A. He looked at Katherine, and he said, "At what stage do you de-ice?" And, at that time, Katherine looked at him, and she said, "Well, we have automatic de-icers, sir." And then, at that time, he looked at her, and he said, "Yeah, but only on the leading edges."

And, at that time, Katherine just went like – she just shrugged her shoulders with this type of look, and she looked at me and –

- Q. She shrugged her shoulders and looked at you?
A. Yes.
Q. What did you feel at that point in time?

A. Uncomfortable.

Q. Why?

A. Because I was thinking of that Gander incident about the possibility of ice on the wings, and it just worried me seeing that white, fluffy snow on the wings. And then I thought, My goodness, if she's – you know, it just seemed so strange that – I just felt very uncomfortable with the snow on the wings, and Katherine, being a very experienced flight attendant.

(Transcript, vol. 10, pp. 229–30)

Constable Swift's recollection of the conversation corroborated Mrs Hartwick's version. He recalled being advised by Mrs Say that the snow on the wings would blow off on the takeoff roll and that the aircraft was equipped with a built-in de-icing device that would take care of the problem. Constable Swift testified he was sceptical of these claims:

Q. Would you tell the Commissioner about the substance of that conversation, Sir?

A. Well, Sir, I had indicated that I felt the aircraft should have been de-iced. In fact, I questioned, asking that, are they not going to de-ice the airplane prior to takeoff?

At that point, a reply came back, and I can't be certain who said that – I believe it may have been Katherine Say – said that it is light, fluffy snow and it will blow off on rollout.

I still found that a little hard to accept myself, and I may or may not have indicated, I don't think so, I don't believe it would.

And I believe it was told to me that not to worry, this aircraft has a built-in device and – thinking that that would take care of the problem.

Once again, I was skeptical in that remark. I didn't think that this particular aircraft had a built-in de-icer. It may have had an inflatable boot or ice boot at the leading edge of the wing, but I didn't think that it had a built-in de-icer, as the way it was – I was interpreting it.

(Transcript, vol. 18, pp. 79–80)

Mrs Say may have believed that the F-28 was equipped with some sort of ground de-icers, when in fact it was not. This apparent misapprehension on her part graphically demonstrates the need for air carriers to involve the cabin crew, jointly with the cockpit crew, in an education program related to the ground de-icing of aircraft and stressing the dangers of takeoff with contaminated wings. She might not then have entertained the belief that the snow would blow off or that a self-de-icing wing existed. More importantly, she would have been confident enough to communicate Constable Swift's valid concerns to the captain.

The evidence shows that both Constable Swift and Mrs Hartwick were of the view that the snow was not going to blow off the wings during takeoff. Mrs Hartwick was very clear in her recollection that the snow was wet and sticky. Being a resident of Northern Ontario, at Sudbury, she easily differentiated between dry, flaky snow that blows away and wet, sticky snow that adheres to objects on which it falls. She testified it was the latter type of snow she observed on the F-28 wings at Dryden.

It was clear to me that both Mrs Hartwick and Constable Swift were uncomfortable with the fact that the F-28 was not going to be de-iced. Both testified they did not believe that the snow would blow off. However, neither one of them pressed the issue with the in-charge flight attendant, Mrs Say, or with a member of the flight crew. Although Constable Swift and Mrs Hartwick possessed elementary knowledge of the effects of wing contamination and were sceptical of the reassurance offered by Mrs Say, neither one of them pursued their concerns any further.

Constable Swift testified that on March 10 he was experiencing pain in one of his ears because of altitude changes during flight. He was preoccupied with this pain and, although he was concerned about the contaminated wing condition, he resigned himself to the fact that the crew were “professional people” whose judgement he would respect:

A. ... these are professional people, they make a living by flying these things and I don't. I make my living by riding on them.

I had accepted the fact that this aircraft – perhaps someone had made the decision it was safe to fly.

(Transcript, vol. 18, p. 81)

Constable Swift's eventual and understandable decision to rely on the professionalism of the flight crew reflects the attitude of the general air-travelling public. It does not explain, however, why the cabin crew and the two off-duty airline pilot passengers did not take some positive action in the circumstances described.

Mrs Hartwick, by virtue of her limited training, was not well versed in the theory of flight or in the technical aspects of the effect of contamination on the ability of the aircraft to fly. A number of prior experiences as a flight attendant had a bearing on her reactions to the pre-takeoff situation, however, and, in all probability, had a similar impact on Mrs Say.

The presence of snow on the wings of an aircraft was not a new experience for Mrs Hartwick. She testified that while she was working as an Air Ontario flight attendant on the Convair 580 aircraft, she had experienced a takeoff when the aircraft had snow on its wings. The snow on that occasion was dry and powdery, and it blew off during takeoff. She also recalled having observed pilots of the Convair 580 and Dash-8

aircraft check the snow on the aircraft fuselage with their hands before entering the aircraft. Mrs Hartwick testified that before March 10, 1989, she had never been in an aircraft that attempted a takeoff with wet, sticky snow on its wings.

There appear to have been a number of factors that mitigated against Mrs Hartwick or Mrs Say going to the cockpit and conferring with Captain Morwood about the contaminated condition of the wings. Mrs Hartwick testified that there was a feeling among flight attendants that pilots did not accept them as part of the crew in an operational context. She described what I regard as a serious dichotomy between the cockpit crew and the cabin crew:

- A. Well, we have – the pilots and the flight attendants have respect amongst one another as friends but when it comes to working as a crew, we don't work as a crew. We work as two crews. You have a front-end crew and a back-end crew and we are looked upon as serving coffee and lunch and things like that.

(Transcript, vol. 11, p. 117)

Mrs Hartwick recalled instances where she had, on previous flights, gone forward to the cockpit with safety concerns, only to be told by the pilots not to worry, even though the pilots had conducted no visual checks to verify or dispel the concerns she had raised. In one instance she related, she saw what appeared to be a rivet sticking out of the wing and, in another case, she noticed some oil on the wing. Both of these incidents occurred on the Convair 580, when she was a relatively new flight attendant, and she was left with the impression that, by reporting such matters, she had appeared stupid inasmuch as the pilots did not seem to be interested in or concerned with her report to them.

There were other instances, Mrs Hartwick recalled, where the pilots had shown interest in her concern and had taken the time to make checks and to keep her informed. She observed that the attitude and cooperation of the pilots varied, depending on the character and disposition of the individual:

- Q. ... The kind of reactions that you would get from a pilot when you had a concern ... would it vary from pilot to pilot?
- A. Yes, it would. There's some pilots that took more of an interest to explain to you what something was.

(Transcript, vol. 11, p. 118)

There was no doubt in Mrs Hartwick's mind that certain captains were not disposed to consider information from flight attendants seriously. Moreover, the evidence also shows that Air Ontario flight operations management, despite a history of previous incidents

involving takeoffs with contaminated wings, did not seem to grasp or understand the reluctance on the part of flight attendants to approach a captain with their safety-related observations and concerns. This lack of understanding by senior management was highlighted by two post-crash telephone conversations between Mrs Hartwick and Mrs Ruthe-Anne Conyngham, Air Ontario manager of in-flight services.

In view of Mrs Hartwick's expressed concerns about snow on the wings before the takeoff at Dryden, Mrs Conyngham was curious why Mrs Hartwick did not do something to satisfy her concerns, such as speaking to the captain. Mrs Hartwick testified as follows regarding her conversations with Mrs Conyngham after the Dryden crash:

- A. There was a specific question at that time that she mentioned to me. It was only in mentioning. She mentioned, well, the guys upstairs – and I don't know who she meant, who were these guys upstairs. I only figured out to myself they must be some sort of officials in upper management; brought the question, well, if Sonia had such a gut feeling about the snow on the wings, well, why didn't she say anything.

And I said – and then Ruthe-Anne mentioned that she, in turn, explained to them that it was not my position to make such a decision or my position or job to actually go up and tell the captain that he required de-icing at that time.

I have been asked this question twice on two different telephone conversations and during the second telephone conversation I mentioned to her that if she would like to do a little bit of investigating herself – because I felt very horrible that these people were trying to put this back on my lap, I said, well, there is an incident that occurred in December of 1987 out of Toronto. It was a Hawker 748 which took off from Toronto Airport.

(Transcript, vol. 11, pp. 109–10)

The December 1987 incident referred to by Mrs Hartwick in her conversation with Mrs Conyngham concerned an HS-748 aircraft under the command of Captain Joseph Deluce, who later became chief pilot for Air Ontario's F-28 and Convair 580 aircraft and the project manager of the F-28 program. It is reviewed in detail in chapter 24, Flight Safety, and is referred to in this Report as the "December 15, 1987, incident."

The evidence showed that the December 15, 1987, incident involving Captain Joseph Deluce was a subject of discussion throughout the company. It involved a takeoff in inclement weather conditions with a snow accumulation on the aircraft surfaces, resulting in violent vibration on climb-out and the need to execute an emergency landing. The flight attendant on that flight, Ms Alana Labelle-Hellmann, who was called as a witness before this Inquiry, testified that she had expressed her own

concerns about the snow accumulation as well as those of passengers aboard the flight directly to Captain Deluce, but was told to take her seat. Captain Deluce, for his part, testified he had no recollection of this conversation with Ms Labelle-Hellmann. The first officer, Mr Scott Jensen, testified he could not remember whether Ms Labelle-Hellmann had come to the cockpit on this occasion. I found Ms Labelle-Hellmann to be a very credible witness, and I accept her evidence.

Mrs Hartwick's knowledge of this incident and the manner in which Captain Joseph Deluce was reported to have responded to the concerns expressed by the flight attendant and passengers on the flight clearly had a profound impact on her. Undoubtedly this incident influenced her conduct on March 10, 1989.

When asked why she had mentioned the December 1987 incident, Mrs Hartwick stated:

- A. Because it dawned on me after the incident, I thought, well – it seems that people were trying to push the blame on me and I feel guilty as it is but I thought of this incident [the December 15, 1987, incident] and it was a very specific incident that where a flight attendant actually went up to the flight deck to inform a captain of the snow on the wings and what his response was to that.

(Transcript, vol. 11, pp. 111–12)

Regardless of the facts of the December 15, 1987, incident, I believe it crystallized the understanding of the respective roles of pilots and flight attendants at Air Ontario, as perceived and described by Mrs Hartwick. Even if the day-to-day pilot/flight attendant crew relationships varied, depending on the personnel involved, the perceptions created by the December 15, 1987, incident were to have a lasting effect at Air Ontario.

The testimony of Ms Labelle-Hellmann about the perceptions of flight attendants with respect to operational concerns on board aircraft corroborated that of Mrs Hartwick. I was struck by the similarity of the events experienced by Ms Labelle-Hellmann and the passengers involved in the December 15, 1987, incident to those at Dryden on March 10, 1989.

Ms Labelle-Hellmann's evidence was of considerable assistance in attempting to arrive at a rationale for, and an understanding of, the conduct of Mrs Say and Mrs Hartwick on March 10, 1989. Ms Labelle-Hellmann testified that, during her initial flight attendant training in 1985, she had been instructed that, with respect to safety-related matters, she had the "authority to go up there [the cockpit] and insist that it be taken care of" (Transcript, vol. 106, p. 60). However, following this initial training and up to the time of the December 15, 1987, incident, the practical aspects of being a flight attendant somewhat altered her views. She testified:

- A. I just got to know basically a pilot's role and a flight attendant's role. We ... were there for safety ... and serving and taking care of passengers, but ... for de-icing incidents and things like that, I wouldn't make a call like that. I would try to have enough faith in the pilots and hope.

(Transcript, vol. 106, p. 60)

There was a further practical concern that may have influenced Ms Labelle-Hellmann not to be more forceful with Captain Joseph Deluce on December 15, 1987:

- A. Well, you could – you would probably be attached with – it was a smaller company ... it would become known and ... it would just be hard and you could get a bad schedule and different things like that could happen.

(Transcript, vol. 106, p. 61)

Ms Labelle-Hellmann had experienced other HS-748 takeoffs when there was snow on the wings. Like Mrs Hartwick, she testified that such takeoffs did not involve wet, sticky snow, but dry snow that blew off on takeoff.

Having heard the testimony of Mrs Hartwick and Ms Labelle-Hellmann, it is not difficult to understand why flight attendants at Air Ontario may have come to the conclusion that management, as well as at least some pilots, were not interested in the opinions or observations of flight attendants on operational matters.

In addition to the factors enumerated, I am of the view that Mrs Hartwick's expressed fundamental respect for and trust in the professionalism of both Captain Morwood and Mrs Say was a compelling factor influencing her not to go to the cockpit to voice her own concerns. She testified as follows:

- Q. ... maybe you can tell the Commissioner in your own words why you didn't go up to the cockpit to tell Captain Morwood about what you observed on the wings. Why didn't you go up?

- A. Well, on March 10th it was not only obvious to myself and the passengers on board flight 1363 that it was snowing in Dryden, but it was something that the captain was aware of as well. It wasn't just snowing over the wings, it was snowing throughout Dryden, Ontario, at the time.

And not only is the captain an expert and a professional with these types of things, the captain has in his possession the temperatures, the winds, the weather conditions, and at that time he is the expert to make the decision such as de-icing.

Also, after conversation with Katherine Say, I looked upon her as a very professional person and I still do. She had ten years of experience and she was a very conscientious person and

at that time I did not feel it was my place to overstep her as I respected her very much so as I did Captain George Morwood. He was a very special pilot.

(Transcript, vol. 11, pp. 112–13)

As professional pilots, Captain Berezuk and Captain Haines had an in-depth understanding of the danger of wing contamination. In the context of the prevention of similar accidents in future, the reasons given by these two pilots for not bringing the wing contamination to Captain Morwood's attention before takeoff are equally as important, in my view, to those given by Mrs Hartwick.

The lack of affirmative action by Captain Berezuk and Captain Haines was most unfortunate in this instance since any indication of concern on their part would in all probability have been considered seriously by either flight attendant and by Captain Morwood. Knowing that a professional pilot was concerned would likely have convinced one of the flight attendants to relay such concern to Captain Morwood. If this had occurred, Captain Morwood would in all probability have been encouraged to assess the condition of the aircraft wings and to reconsider his injudicious decision to take off. Failing this outcome, both off-duty pilot passengers had the right, as did any passenger on board, to demand to be let off the aircraft when it appeared that the danger posed by the contaminated wings would not be rectified. In the case of flight 1363, it was obvious that the rectification required was de-icing of the aircraft.

The evidence of Captain Berezuk and Captain Haines differs somewhat on the particular reasons why they did not raise their concerns directly with the flight attendants, but there are two points on which they both agree. They had both assumed, prior to takeoff, that the pilots of the F-28 were aware of the condition of the wings and Captains Berezuk and Haines both believed that the aircraft was going to be de-iced. Captain Berezuk knew that the de-icing equipment at Dryden was at the ramp, so he expected they were going to return to the ramp. If the aircraft was not de-iced, he felt that takeoff would be aborted should the snow not come off the wings during the takeoff roll, a highly dangerous practice in itself (see chapter 24, *Flight Safety*).

Captain Berezuk stated:

- A. ... when we were waiting for the small airplane to [land], that we were sitting at that point for approximately five minutes, and at that point I told my wife that at that point we'd probably be delayed even further because we probably would have to go back for de-icing.
- Q. So you thought at that time the aircraft was going to go back or might go back and de-ice?

- A. That is correct.
- Q. Now, having seen – having seen the snow on the ice and you saw the – or snow on the wing as it was taxiing down the runway, and you had a concern, would you as a captain had you seen the snow on the wing gone back and de-iced?
- A. Yes.
- Q. Now, if you would have gone back and de-iced the aircraft had you seen as a captain the snow on the wings, can you tell me why you did not communicate your concern to the crew of the aircraft?
- A. Up until the final point or final second before takeoff, I was not aware of the pilot's judgment or decision about regarding de-icing.
- Q. Now, can you explain that to me. Why were you not aware of his decision or the crew's decision?
- A. As making decisions as a captain of an aircraft, at any time you can stop the proceedings up until the point of power application.
- Even after the point of power application if you deem necessary in order of safety or if something doesn't seem right, at any time you can stop the process.
- Q. So when the aircraft was taxiing down backtracking to commence its takeoff, are you saying that you thought that the captain or the crew might go back and de-ice the aircraft?
- A. Yes.
- Q. And when was the first time – when did you realize that the – that the crew, the captain, was not going to de-ice that aircraft?
- A. When the aircraft was rolling down the runway.

(Transcript, vol. 14, pp. 186–88)

As an Air Canada DC-9 pilot, Captain Haines did not operate into Dryden. However, he was quite familiar with the airport since he resided near Dryden and regularly commuted to work at Winnipeg by flying out of Dryden. He testified that he thought, during the initial taxiing away from the ramp and the backtracking on the runway, that the aircraft was proceeding to a remote de-icing area at the Ministry of Natural Resources (MNR). This was a natural assumption for him to have made, since Air Canada often de-ices its DC-9 aircraft at locations remote from the gate. There was no doubt in his mind that the aircraft had to be de-iced and he was convinced that the F-28 would be de-iced before takeoff:

- Q. You fully expected de-icing?
- A. They had to de-ice. I knew that.

(Transcript, vol. 19, p. 35)

- Q. And there's no doubt in your mind that that aircraft had to be de-iced?
- A. Absolutely none. It had to be de-iced. I just talked myself into it.
- Q. Did you personally think it could fly with that amount of contamination on its wings?
- A. Oh, I knew it couldn't.
- Q. You knew it couldn't?
- A. Yes.

(Transcript, vol. 19, p. 37)

Captain Haines offered a further surprising explanation for his lack of assertive action on board the aircraft. He stated in his evidence that he had assumed the wings had some fluid in them, or that there existed "some automatic de-icing system" he did not know about "built into the airplane to take care of the ice on the wings" (Transcript, vol. 19, pp. 36-37). He testified that had he known there was no such on-board deicing system, he would have prevented the takeoff:

- Q. Captain Haines, if you would have known that there was no on-board-the-aircraft system to de-ice, what would you have done?
- A. I would have prevented the aircraft from taking off.
- Q. As a matter of fact, you used a little more graphic term when speaking to me.
- A. I would have broken down the cockpit door, I would have done anything, had I known that the wing was not going to de-ice itself.
- Q. Now, in hindsight, which is always great –
- A. Yes.
- Q. – I guess you were wrong in the assumption you made during those maximum 30 seconds?
- A. Very wrong.
- Q. And how do you feel about that today, Captain?
- A. Terrible.

(Transcript, vol. 19, p. 38)

The evidence before this Inquiry leaves no doubt whatsoever that no built-in automatic de-icing system exists for the ground de-icing of aircraft. I view Captain Haines's explanation based on an imagined built-in automatic wing de-icing system in a 17-year-old aircraft as completely implausible. It likely constitutes an afterthought in his obviously sincere efforts to rationalize his reasons for not taking any action to prevent the takeoff.

In his testimony, Captain Berezuk offered a further and cogent explanation for his passivity in not communicating his concerns to any crew members on March 10. In so doing he identified what I perceive to

be an absence of guidelines to off-duty air crew members travelling as airline passengers in circumstances such as occurred at Dryden. Captain Berezuk stated:

- A. If I was an outside observer looking at an aircraft, there is no written-down procedure or set of rules that I could refer to on how to and when I should express my concern or state my observation to a crew member of that aircraft. There is nothing concrete.

(Transcript, vol. 16, p. 74)

Captain Berezuk also adverted to a so-called "pilot professional courtesy" or "pilot-respect" theory within the professional pilot community, which purports to preclude an off-duty airline pilot, flying on board as a passenger, from drawing to the attention of the cockpit crew an observed safety concern. Because of the serious potential consequences of such a theory finding acceptance among professional pilots, relevant portions of Captain Berezuk's testimony are set out hereunder:

- Q. Now when questioning you about the crew of an aircraft, you stated in your evidence as follows, and I will just summarize it, but you – whether you knew the pilots in the front of the aircraft or not, it could have been one – it could have been one of 10,000 pilots, you wouldn't have changed your mind about not going up front, is that correct?
- A. Correct.
- Q. And you further stated that you were a pilot and they were pilots and you trusted them with your life and the life of the family and the passengers?
- A. Yes.
- Q. And you further stated you expected the same courtesy, respect and authority given to you as a pilot in command of your aircraft as you owed to the other pilots in the profession of aviation?
- A. Correct.
- Q. Now, am I correct in saying then that it was out of professional courtesy that you did not go forward or advise a flight attendant of your concern about the snow on the wings?
- A. Not as a fact of courtesy but, again, respect.
- Q. Out of respect for the competency and capability of that front-end crew?
- A. Yes.
- Q. So, is it fair to say that in your mind on March 10, 1989, this courtesy and respect, that imputed or regarded in the crew, outweighed your concerns for the amount of snow on the wings?

- A. Yes.
- Q. Now, is it fair to say then that you were placing this courtesy and respect for the crew before the safety of the aircraft and your safety on March 10, 1989?
- A. Can you repeat the question?
- Q. Is it fair to say that you place this courtesy and this professional respect before your safety and the safety of the aircraft when you saw the snow on the wings.
- A. Yes.

(Transcript, vol. 15, pp. 9–11)

The most obvious inference that could be drawn from this evidence is that professional courtesy and respect among pilots are more important than safety. If true, this would represent a dangerous attitude and one that common sense would demand be expunged in no uncertain terms. However, later in cross-examination, Captain Berezuk displayed obvious discomfort with this statement. What he really meant, he indicated, was that he trusted Captain Morwood and that, as a pilot, he had a reluctance to interfere and to offer advice to another pilot who was actually flying the aircraft. He admitted his view of "professional respect" to be his own, and that he was not speaking for other pilots. As a captain, he personally favoured an open flight-deck environment and welcomed information from other crew members, including flight attendants:

- Q. Now, I take it, Captain, that, in your mind, as one goes through the training to become even a basic pilot, you go through a rite of passage at the point in time at which you become licensed as a pilot in Canada, and you're something different at that point than you are before; is that right?
- A. I guess it is a feeling that I had, yes.
- ...
- Q. ... Even if you're a nervous passenger in a plane, because you're a pilot and because you know the person flying the plane is a pilot, you're reluctant to interfere and offer him advice about flying the airplane –
- A. Yes.
- Q. – generally? And that's kind of, in your mind, an ethic that pilots have?
- A. I don't know if any other pilot feels that, but I guess I do.
- Q. Now, on the one hand, you feel reluctant to offer advice to another pilot, correct?
- A. Correct.
- Q. On the other hand, you told my friend Mr Wells that you personally encourage an open-cockpit – I should say an open-flight-deck environment; is that right?
- A. That's right.

Q. You welcome the flow of information from other members of your flight crew, including flight attendants, about matters of safety; is that right?

A. Yes.

(Transcript, vol. 15, pp. 113–14)

Captain Haines expressed the opinion that pilot respect or professional courtesy should not prevent a professional pilot passenger from drawing the attention of the cockpit crew to a safety problem. In his view there is no unwritten code of pilot respect or courtesy that prevents one pilot from communicating information to another pilot in matters affecting flight safety. He stated:

Q. And I believe you said the professional courtesy would be to tell the pilot what you know that could affect the safety of this flight?

A. Yes.

Q. Do you feel that most pilots would be of the same mind?

A. I hope so.

(Transcript, vol. 19, p. 143)

Given his stated belief that it was appropriate to do so, the obvious question is why Captain Haines himself did not do anything to draw Captain Morwood's attention to his professional opinion, unequivocally expressed in his testimony, that there was no way the F-28 would successfully take off with the wings contaminated as they were.

The common thread in the evidence of Constable Swift, Mrs Hartwick, Captain Berezuk, and Captain Haines was their expression of reliance on the professionalism of the pilots in the face of perceived danger. There was an assumption by each of them that the cockpit crew was aware of the condition of the wings and that they were dealing with the situation in a proper and safe manner. There is, however, a curious difference between the actions of Constable Swift and those of Captain Berezuk and Captain Haines. Constable Swift, who was not a professional pilot, did not hesitate to make his concerns known to both of the cabin crew members. In contrast, neither Captain Berezuk nor Captain Haines, the professional pilot passengers, made mention of their concerns to either of the flight attendants. Post crash, however, both of these captains testified that, in similar circumstances in future, they would take a different course of action. This is suggestive, in my view, of the validity of Captain Berezuk's notion of an unwritten code of professional courtesy or respect among at least some pilots that militates against the communication of even a perceived life-threatening safety concern to the cockpit crew. There are, however, at least four other factors that could influence an off-duty airline pilot on board an aircraft from making

known to the captain his perceived safety concerns: a simple act of faith in the professionalism of the captain; the fear of offending the captain and possible rebuke for unsolicited advice; the fear of embarrassment in the event that the concern expressed proved groundless; and a reluctance to interfere in the obviously busy cockpit routine prior to takeoff.

Whatever the reason, the evidence before this Inquiry points unerringly to the existence of a general reluctance on the part of the cabin crew and the off-duty airline pilot passengers on flight 1363 to intervene in any way with the conduct of the operation of the aircraft by the operating pilots, even in the face of apprehended danger.

Evidence was also heard with respect to several other unrelated occurrences in which there was a reluctance to communicate information to the cockpit crew. In other incidents, the operating pilots viewed information communicated to them with great scepticism or chose not to act upon it.

Mr David Adams recounted his personal experience on board an aircraft shortly after he had participated in the Canadian Aviation Safety Board (CASB) investigation at the crash site at Dryden. Mr Adams, who was en route from Thunder Bay to Toronto, boarded an Air Canada 727 aircraft that had been sitting at the gate overnight. On looking out a window prior to takeoff he noted that the wings had approximately a half inch of wet snow on them. He was extremely disturbed by this observation, but was initially hesitant to raise the issue with either of the flight attendants or the pilots. Finally, he spoke to a flight attendant, requesting her to ask the captain when de-icing would occur. The flight attendant complied with his request and, approximately one and a half minutes later, an announcement was made that the aircraft would be delayed while de-icing took place. It is of some significance that an experienced aircraft accident investigator felt an initial reluctance to deal quickly and assertively with what he perceived to be a dangerous situation.

To amplify the point further, Mr Adams referred in his evidence to the crash of a Boeing 737-400 on January 8, 1989, at Kegworth in the United Kingdom. The aircraft had developed an engine vibration and the pilots inadvertently shut down the wrong engine. The aircraft was, as a result, left flying on the engine that was actually experiencing a malfunction. The cabin attendants and a number of passengers on board the aircraft watched sparks, flames, and pieces of the engine being spewed out the rear of the malfunctioning engine, yet no one took the initiative to notify the captain. The aircraft crashed and a number of passengers were killed.

Mr Adams aptly summed up a problem that has been identified in several aviation accidents, including that at Dryden: "[I]t's one of those issues where ... the information to correct the situation is perceived accurately by somebody on board the aircraft, but is not brought to the

attention of the people who can do something about it" (Transcript, vol. 157, p. 43).

In order to remove any possible vestige of doubt about the matter, I believe the time has come for air carriers to counsel their pilots that it is appropriate for off-duty airline pilots on board an aircraft as passengers to draw any perceived safety concern to the attention of the captain. In fact, the time has come for all components of the aviation industry, be they regulators, carriers, or industry associations, to support the notion that it is not only acceptable but expected that off-duty airline pilots on board an aircraft as passengers communicate perceived safety concerns without fear of rebuke.

Later in the hearings, Captain Charles Simpson, vice-president of flight operations for Air Canada, was asked whether an ethic existed that might inhibit a pilot from expressing a concern. He responded in the negative, and expressed the view that a pilot was obliged, as part of his responsibility as a citizen, to report his concern:

- A. No, I think that – I think in fact, I think it's an obligation of a pilot to do that. It's a little like what is the responsibility of a citizen. I think there is a definite responsibility there.

(Transcript, vol. 123, p. 164)

It was refreshing to hear a respected senior officer of a major airline make such a clear and unequivocal statement of principle on a subject I consider to be of great importance to the advancement of aviation safety. Based on the evidence I have heard, and considering the complexity and the size of jet aircraft flying today, there can be little doubt that the cockpit crew can benefit from the eyes and ears of all aboard an aircraft, but especially from those possessing special skills.

I will now outline what I perceive to be the most effective solution to the basic flight crew communications problem identified during the hearings of this Inquiry.

According to the evidence, an environment of near-complete separation of cabin crew and cockpit crew responsibility appears to have been fostered by Air Ontario management and by some Air Ontario pilots. As a result, flight attendants were discouraged from becoming involved in operational matters and were led to believe they should simply trust the pilots to deal with any operational problems that arose in flight. Mr Adams offered some insight into this ill-advised and short-sighted attitude:

- A. If you look at almost any company, you will usually find that the cabin attendants and the flight crew are very very clearly separated. They work for different branches of the company in most cases. The culture is one of almost complete separation. Yet

the fact of the matter is, in a safety situation, these two sections of the company have to work together. And the consequences of not efficiently working together quite often means a bunch of people get killed.

(Transcript, vol. 157, p. 50)

At Air Ontario, prior to the March 10, 1989, crash, the evidence shows that new flight attendants were taught simply to have confidence in the pilots. The report of the human factors and survivability group, introduced into evidence by Mr David Adams, refers to an interview with and a statement given by Mrs Ruthe-Anne Conyngham, manager of in-flight services for Air Ontario, who was responsible for flight attendant training. Mrs Conyngham was asked the following question: "There's been a lot of reports about the contamination on the wings of this aircraft. Would that be something that the flight attendants would look at?" Her reply is telling and sets out what I believe to be the reason for the lack of assertive action by Mrs Say and Mrs Hartwick with regard to the pre-takeoff concern about wing contamination. Both flight attendants, in the view of Mrs Conyngham, conducted themselves in precisely the manner expected of them, based on their training:

... It's just not the mind set that I would be in. I can't believe there would be many flight attendants that would be in the mind set where they would be looking at something like that ... I think it would be a very unusual thing for somebody to look out the window and say gee, I think there is too much something on this wing. It would be remarkable if somebody did that. Extremely exceptional ... I have a lot of confidence in these pilot[s] and the whole safety system in Canada, particularly in Canada. And I think that's instilled in, I instill it certainly in new flight attendants and you have to have, to have confidence in the team and that would be my second reason. That it would sort of be out of character unless something is tremendously blatant, for the flight attendant to question that confidence ...

Statements such as those made by Mrs. Conyngham indicate that Kathy Say and Sonia Hartwick did exactly what the system expected them to do. It also helps explain CA Hartwick's interpretation of Kathy Say's gesture to Officer Swift:

"I don't know what that meant. I know what it meant in a way, but again, **ITS NOT UP TO US.**"

(Exhibit 1258, pp. 91-92)

The Need for Crew Cooperation

Having heard the testimony of flight attendants Hartwick and Labelle-Hellmann, and having reviewed the detailed expert testimony presented

before this Inquiry pertaining to the human factors elements of this crash, I find that the reluctance of Mrs Say and Mrs Hartwick to convey their own valid concerns, and those of passengers, to the cockpit crew was the product of a mind-set ingrained in them by virtue of their training, or lack thereof, and the failure of Air Ontario management to coordinate properly the activities and responsibilities of their cabin and flight crews.

A basic problem on board flight 1363 clearly appears to have been one of lack of crew coordination. While it would not be difficult specifically to direct flight attendants to raise operational safety concerns with the pilots and also to direct the pilots to treat such intervention seriously, in practical terms mere directives are not sufficient. Closer cooperation, or crew coordination, between pilots and flight attendants in operational safety matters is clearly desirable in the interests of aviation safety. Such crew coordination must, however, be structured and developed through appropriate training, with limits imposed that are realistic, practical, and understood by all concerned. A careful balance must be struck between ensuring that pilots are aware of all operational problems and discouraging flight attendants from intruding into the cockpit at random.

As a result of previous accident investigations, where interruptions and non-relevant conversations were found to be distractions that detracted from the pilots' concentration, the Federal Aviation Administration (FAA) of the United States implemented what is commonly referred to as the sterile cockpit rule. This rule, referred to by Dr Robert Helmreich in his evidence, is, in fact, Federal Aviation Regulation (FAR) 121.542, part of which states:

- (b) No flight crewmember may engage in, nor may any pilot in command permit, any activity during a critical phase of flight which could distract any flight crewmember from the performance of his or her duties or which could interfere in any way with the proper conduct of those duties. Activities such as eating meals, engaging in nonessential conversations within the cockpit and nonessential communications between the cabin and cockpit crews ... are not required for the safe operation of the aircraft.
- (c) For the purposes of this section, critical phases of flight includes all ground operations involving taxi, takeoff and landing, and all other flight operations conducted below 10,000 feet, except cruise flight.

Dr Helmreich and his colleagues conducted extensive research in an attempt to establish how stressful situations impact on the dynamics of crew interaction. Analysis of conversations from cockpit voice recorders recovered from accidents were used for this purpose. In his testimony

before me, he referred to two aviation accident investigations he had examined in some detail, both of which had an impact on the issue of pilot and flight attendant cooperation.

The first accident involved a Boeing 727 that crashed on takeoff at Dallas, Texas. The National Transportation Safety Board found that the crew failed to extend the flaps for takeoff. Dr Helmreich testified that the three pilots and one flight attendant were involved in social conversation that was dominated by the first officer. Just before the aircraft departed from the ramp, when a final check of the aircraft configuration should have been conducted, there was a flurry of social communications among the four crew members.

The second accident referred to by Dr Helmreich involved an MD-80 aircraft taking off at Detroit, Michigan, when the crew again failed to extend the flaps and slats prior to takeoff. The relevant taxi checklist was not completed. The crew was engaged in extensive social communications involving the two pilots and a flight attendant who was in the cockpit at the time.

The cases alluded to by Dr Helmreich demonstrated that whatever is ultimately done to ensure that flight attendants become part of a more effective flight safety team, it is critical that a delicate balance be struck and maintained whereby, on the one hand, pertinent information is exchanged between pilots and flight attendants, and on the other, an unnecessary intrusion into the cockpit is restricted at critical times. Mr Adams identified the nature of the on-board communications problems and outlined three elements essential to a solution:

The real heart of the communications problem and therefore the potential coordination problem, is not that Cabin Attendants are universally discouraged from talking to the flight crew, but rather, they are discouraged from talking to the flight crew about specific subjects. For example, if a Cabin Attendant goes forward to the Flight Crew to point out that some emergency cabin equipment is not functioning, this would be almost universally accepted by both the flight crew and the cabin crew as a legitimate and acceptable communication. However, if a Cabin Attendant goes forward to the flight crew to point out to the Captain that he or she believes there is too much snow on the wings, this would in general not be considered by most flight crew and many cabin attendants as a legitimate or acceptable communication.

In this type of scenario, the Cabin Attendant seems to have only three allies. They are: a clear and well-promoted company policy; a Captain who will consider any information from any source; or an individual Cabin Attendant characteristic of assertiveness.

Air Ontario seemed to lack many of the elements that would be seen as providing clear and unreserved promotion of efficient operational communications between its flight and cabin crews.
(Exhibit 1258, pp. 90-91)

The resolution to this communications problem would appear to be founded in well-planned and structured crew coordination or crew resource management¹ (CRM) training of both the pilots and the flight attendants. Dr Helmreich was firmly of the view that had the four crew members of flight 1363 completed extended CRM training and accepted its concepts, there may have been an exchange of information that would have prevented the attempted takeoff in the circumstances described.

It became very clear from the testimony of Dr Helmreich, Dr C.O. (Chuck) Miller, and Mr Adams that the effectiveness of any type of CRM training is contingent upon the commitment of the employer and the employees involved. The attainment of such a commitment is not easily achieved. Without a dedicated commitment by the employer to introduce, facilitate, and stand behind CRM training, such training is likely to have little or no impact on its primary goal of safety enhancement. Dr Helmreich stated:

- A. ... the organization has to sanction the new norms that you adopt. And that goes back to our issues about, if you will, about C.E.O.s and management and all of that.

Because, you can provide that training from hell to breakfast, but if the organization doesn't sanction it, the training will have no impact. So, it requires organizational commitment.

It also requires the establishment of norms through role models, and consistent reinforcement of it ...

...

So the answer is, you have to have an organizational commitment to believe in what's important, you have to provide the mechanisms to train people, provide the opportunities, and

¹ The application of human factors concepts in the flight deck environment was initially known as cockpit resource management. More recently, as human factors programs have come to include other participants in the aviation system, such as cabin crews and maintenance personnel, the phrase crew resource management (CRM) has come into wide use. CRM refers to the effective use of all available resources – human, hardware, and informational. It encompasses optimizing both the person-machine interface and interpersonal activities, including effective team formation and maintenance, information transfer, problem solving, decision making, maintaining situational awareness, and dealing with automated systems. Training in CRM thus involves basic indoctrination and recurrent training of crews in human factors concepts as they relate to the aviation system.

ultimately, you have to be willing to say, this behaviour is not only expected, it is required.

(Transcript, vol. 158, pp. 139–40)

The kind of commitment described by Dr Helmreich will not be realized by simply mandating that CRM training be undertaken. The three expert witnesses who testified in the area of human factors, Dr Helmreich, Dr Miller, and Mr Adams, were firmly convinced that there needs to be a certain degree of economic trade-off between the regulator and the airlines in order to ensure that an appropriate program of CRM training is undertaken and conducted. There was no disagreement among them that, in the case of major airlines, CRM training should be mandatory. What was discussed, and merits further consideration, is a regulatory trade-off system whereby a major airline with a well-developed CRM training program in place is given leeway with respect to certain regulatory matters that are required in the absence of a CRM training program.

Dr Helmreich testified as follows regarding the FAA experience on the issue of trade-off or economic incentives:

- A. ... what the FAA has tried to do with the AQP [Advanced Qualification Program] is provide some very important incentives, aside from the true safety benefits which they recognize, but some economic incentives in terms of checking and standards that make it extremely desirable to implement training that they feel is important anyway.

I think that does good things. It makes the organizations and it makes the people feel like they're not getting the program rammed down their throat.

(Transcript, vol. 158, pp. 143–44)

Having considered the testimony of the human performance experts who appeared before this Inquiry, and the evidence of Mrs Conyngham, Ms Labelle-Hellmann, and Mrs Hartwick, I am convinced that had the crew of flight 1363 been exposed to extended CRM training, there is every likelihood that a full and complete exchange of information would have occurred between the flight attendants and the pilots of flight 1363, with the result the aircraft may not have attempted its fateful takeoff.

The issue to be addressed by CRM training, specifically in the context of contaminated wings, is relatively simple. Following the recommendation made in my first *Interim Report*, Canada has now adopted the clean wing concept and, by so doing, has removed the discretionary aspect of whether a takeoff may be attempted with a degree of contamination adhering to the wings.

Apart from the primary responsibility on the cockpit crew to ensure that the aircraft wings are free of contamination prior to takeoff, an additional safety factor, related to crew resource management, can be introduced at no cost. The implementation of a simple mandatory crew procedure, prior to departure from the gate, in adverse winter weather conditions would introduce a double-check against the possibility of takeoff with contaminated aircraft wings. Further to the relevant recommendations contained in my first and second interim reports regarding joint cockpit crew–cabin crew training related to wing contamination, it appears desirable to adopt the following procedures:

- That the captain of an aircraft operating in adverse winter weather conditions be required formally to advise the in-charge flight attendant, prior to departure from the gate, whether ground de-icing of the aircraft is to take place and, in order to eliminate potential apprehension on the part of the passengers, that they be advised of such intention on the public address system of the aircraft.
- That, at any time prior to commencement of the takeoff roll, in the absence of advice by the captain that ground de-icing of the aircraft in adverse winter weather conditions is to be conducted, the in-charge cabin crew member be required to report to the captain his or her own concerns, or any concerns conveyed to him or her by any cabin crew member or any passenger on board the aircraft, relating to wing contamination.

It is important, however, not to lose sight of the fact that CRM training is concerned not only with contaminated wings. The exchange of information between the aircraft pilots and flight attendants covers a multitude of areas I do not consider necessary to canvass in this report. The entire spectrum of cabin crew–cockpit crew communication can best be addressed by well-trained crews having an appreciation and understanding of their respective roles and operating as a team. Because the issue of information exchange between pilots and flight attendants involves many historical and, in some cases, institutionalized behavioural norms, only a serious commitment by all segments of the industry and the regulator to provide CRM training for both pilots and flight attendants will produce the necessary operational environment and standard operating procedures needed to enable the aircraft crew to operate safely as a team.

Air Canada introduced cockpit resource management training for its pilots in January 1989, and over half of its pilots have completed the course to date. All Air Canada pilots are expected to complete this training by late 1992. Mr William Deluce, Air Ontario president, testified

that Air Ontario has taken a corporate decision to introduce cockpit resource management training commencing in "the early part of 1991" (Transcript, vol. 153, p. 66). While clearly laudable in themselves, these initiatives must, in the interests of aviation safety, be expanded to involve the cabin crew jointly with the cockpit crew in a program of crew resource management training.

RECOMMENDATIONS

It is recommended:

- MCR 171** That Transport Canada implement regulations requiring air carriers to provide approved crew resource management training and standard operating procedures for all Canadian air carrier flight crews and cabin crews. This training should be designed to coordinate the flight activities and information exchange of the entire air crew team, including the following particulars:
- (a) As part of such crew resource management training, joint training should be carried out involving all captains and in-charge cabin crew members in order that each fully understand the duties and responsibilities of the other.
 - (b) All cabin crew members should be given sufficient training to enable them to recognize potentially unsafe situations both in the cabin and outside the aircraft. If it is necessary to prioritize such training, it should first be provided to all in-charge cabin attendants.
 - (c) As part of normal pre-flight announcements over the aircraft public address system, passengers should be advised that they may draw any concerns to the attention of the cabin crew members.
 - (d) All cabin crew members should be trained and instructed to communicate all on-board safety concerns they may have or that may be communicated to them by any passenger to the captain through the in-charge cabin crew member, unless time or other circumstances do not permit following this chain of command.

- (e) All in-charge cabin crew members, after appropriate training, should be encouraged in adverse winter weather conditions to monitor the condition of the surface of the aircraft wings as part of the pre-takeoff cabin routine, in order to check for contamination, as a supplement to the captain's primary responsibility in that regard.
- (f) Pilots should be made aware that concerns raised by cabin crew members should be taken seriously and investigated, where appropriate.
- (g) Pilots should be instructed that when travelling as passengers on board an aircraft they should never assume that the operating crew is aware of any situation that they themselves perceive to be a safety concern. Such pilot passengers should be encouraged to raise such concerns with a cabin crew member and request that the information be given to the captain.

MCR 172 That, in order to dispel any possible notion of "professional courtesy" or "respect" precluding the communication of any dangerous situation, specifically addressing the case of off-duty airline pilots, all Canadian air carriers and the Canadian Air Line Pilots Association provide to each of their pilots a clear statement disavowing any notion that professional courtesy or respect precludes an off-duty airline pilot on board an aircraft as a passenger from drawing a perceived safety concern to the attention of the captain. The statement should indicate that, while it is not mandatory for them to do so, it is appropriate for off-duty pilots who are on board an aircraft as passengers to communicate to the captain, through the intervention of a cabin crew member, any safety-related concerns perceived on board the aircraft.

MCR 173 That the captain of an aircraft operating in adverse winter weather conditions be required formally to advise the in-charge cabin crew member, prior to departure from the gate, whether ground de-icing of the aircraft is to take place and, in order to eliminate potential apprehension on the part of passengers, that they be advised accordingly on the public address system of the aircraft.

MCR 174

That Transport Canada implement a regulation requiring that, at any time prior to commencement of the takeoff roll, in the absence of prior advice by the captain that ground de-icing of the aircraft in adverse winter weather conditions is to be conducted, the in-charge cabin crew member be required to report to the captain his or her own concerns, or any concerns conveyed to him or to her by any cabin crew member or any passenger on board the aircraft, relating to wing contamination.

HUMAN PERFORMANCE: A SYSTEM ANALYSIS

In the first *Interim Report* of this Commission, issued in November 1989, I found that on the basis of the overwhelming evidence of the surviving passengers and other eyewitnesses, the upper surfaces of the aircraft C-FONF were severely contaminated with heavy, wet snow prior to its attempted takeoff and that such contamination was at least a contributing factor to the crash.¹ Although further investigative and expert testimony had yet to be heard, the evidence available to me at that time convinced me that steps had to be taken prior to the 1989–90 winter flying season to heighten the awareness of the aviation community to the dangers of wing contamination. Accordingly, I made three recommendations directed at implementing a “clean wing” policy in Canadian aviation.

Subsequent to issuing my first *Interim Report*, I heard expert evidence regarding the performance and flight dynamics of the Fokker F-28 Mk1000 in studying the crash of flight 1363. The essential task of these experts was to assess the physical “flight dynamic” causes of the crash by examining aircraft systems, structures, and engine performance.

Without the information from the flight data recorder (FDR) and the cockpit voice recorder (CVR), this technical analysis was more difficult than it might otherwise have been. The technical analysis of the accident was necessarily based upon wreckage examination, eyewitness and expert testimony, and computer reconstruction of the takeoff and flight path.

The performance, investigative, and flight dynamic evidence, considered at length in chapters 10–12, has satisfied me that:

- there were no discernible defects in the aircraft’s structures, systems, or engines that directly affected the performance of the aircraft; and
- the immediate cause of the crash is attributable to the contamination of the aircraft lifting surfaces at the time of takeoff.

¹ *Interim Report*, p. 25

The Fundamental Question

The implication of the findings of the technical and performance aspects of this investigation is that the flight crew, in particular Captain Morwood as the pilot-in-command, erred in commencing the takeoff with contamination on the wings.

The flight crew represents one component in the air transportation system which must be evaluated in the investigation like any other component, such as aircraft engines or aircraft structures. If a failure of a component is identified, there must be an examination of both the causes of the failure and the backup systems or redundancies that are expected to prevent or mitigate the component failure. In the present case, having identified that there was a failure on the part of the flight crew of flight 1363, the following fundamental question must be addressed:

- Why did the pilot-in-command attempt to take off with contamination on the wings?

In keeping with the system analysis, two further questions are suggested:

- What caused or prompted the pilot-in-command to make the decision to take off?
- What system safeguards should have prevented or altered the decision to take off?

These questions, which relate to a failing of the human component of the air transportation system, are the subject of investigation and analysis by experts in the field of human factors.

Human Factors

Aviation occurrence investigations have historically involved inquiry into the human aspects of the occurrence. These may be divided into two broad categories:

- an inquiry into causes of injury and death among passengers and crew;
- an inquiry into the human error that was the immediate cause of the accident or incident and into other human involvement that could have, but did not, intervene to prevent the occurrence.

Internationally accepted conventions call for this investigative approach into the human factors of aviation occurrences.² The Transportation Safety Board of Canada also inquires into the human factors of any aviation occurrence.³

Cause of Injury and Death

The first inquiry is concerned with physical injury and death. The investigators are interested in matters such as the toxicity of combusted cabin interiors, the propagation of crash fires, the structural integrity of the aircraft, and the functioning of emergency exit and crash survival equipment. This aspect of the investigation was discussed in chapter 11, *Aircraft Crash Survivability*.

Human Performance

The second part of human factors investigation is that concerned with the human components directly and indirectly connected to the operation of the aircraft. It includes an examination of the flight and cabin crew to determine if there is anything in their recent history that could have influenced the circumstances surrounding the occurrence, either in a positive or in a negative way. Some of the investigative areas are training, experience, medical considerations, lifestyles, and personal circumstances. This area of investigation, referred to as the human performance investigation, is the focus of this part of the Report.⁴

Mr Gerard Bruggink, a former deputy director of the National Transportation Safety Board (NTSB) in the United States, describes a human performance investigation as follows:

² Exhibit 429, International Civil Aviation Organization (ICAO), *Manual of Aircraft Accident Investigation*, 4th ed. (Montreal: ICAO 1970; amended February 1972), chap. 9, "Human Factors"

³ Exhibit 428, CASB Manual of Investigation; Exhibit 1256, CASB Human Factors Preliminary Investigation Checklist (PIP); and *Transportation Safety Board Manual of Investigation Operations*, vol. 2, part 4: "Investigation Standards and Procedures – Air" (June 1, 1991)

⁴ It should be noted that the terms "human factors" and "human performance" are often used interchangeably to describe the study of the interaction among "man, machine, and the environment" – particularly in the context of examining pilot behaviour. Because there are both crash survival and human operational aspects to human factors investigations, the operational aspect is more properly referred to as "human performance." This is the usage adopted here. Human performance is one aspect of a human factors investigation. See C.O. Miller, "Human Factors in Accident Investigation," *ISASI Forum*, spring 1980 (Exhibit 1243).

The systematic search for the probable reasons why personnel directly involved in the operation of a flight did not, or could not, interrupt the event sequence that terminated in the accident or incident.⁵

While I concur with the above definition, I note that it refers only to personnel directly involved. My investigation went further, to include corporate and regulatory management levels that, although not directly involved in the operation of the flight, may well have had a significant influence on events and circumstances surrounding the flight.

The study of human performance has been applied to the aviation industry, and a body of data has been established that enables researchers in this field to improve their understanding of the decision-making processes of flight crews and the extent to which their decisions are influenced by other components of the air transportation system. These components are as follows:

- the regulatory component: Air Regulations, Air Navigation Orders, surveillance, and monitoring;
- the organizational component: the culture and behavioural norms of the organization as influenced by morale, policies, standards, organizational stability, change, and resources;
- the physical component: weather, operating conditions, and the aircraft, including its condition and capabilities; and
- the crew component: interpersonal coordination and communication among and between flight crew, cabin crew, and support personnel; and the individual characteristics of the aircraft crew members, including training, experience, motivation, personality, attitudes, fatigue, and stress.

The Commission was fortunate to have as witnesses some of the leading experts in the field of human performance investigation to assist in the interpretation of the evidence as it applied to the actions of Captain George Morwood and First Officer Keith Mills. In particular, I was greatly assisted by Mr Gerard Bruggink, who was mentioned above, and Dr C.O. (Chuck) Miller, former director of the United States Bureau of Aviation Safety, NTSB. Dr Robert L. Helmreich, professor of psychology at the University of Texas in Austin, Texas, assisted this Commission by preparing an analysis of the human factors aspect of the crash. The analysis has been used in part in writing this section. Dr Helmreich's

⁵ Gerard M. Bruggink, "Assessing the Role of Human Performance in Aircraft Accidents," *ISASI Forum*, winter 1978

report, "Human Factors Aspects of the Air Ontario Crash at Dryden, Ontario: Analysis and Recommendations to the Commission of Inquiry," is included as number 7 in the Technical Appendices volume of my Report. In addition, I had the benefit of the investigative evidence of the chairman of the human factors and survivability group, Mr David Adams, in 1992 the acting director of the Australian Bureau of Aviation Safety in Canberra, who coordinated the Commission's investigation into the human factors aspects of the crash of flight 1363. Much of what follows in this chapter is based upon the work of these four experts.

By way of illustrating how human performance fits into a systems analytical model, Dr Miller, in one of his publications, provided the following explanation:

Figure [40-1] identifies the traditional man-machine-medium (environment) factors for either accident causation or prevention in a framework of system safety principles identified in the very definition of the term, namely, the influence of the mission and overall management in system safety. It shows not only the significance of an individual factor, for example, man, but also that factor's mutual subset relationship to other factors. In practical terms, it suggests a problem has not been analyzed completely until the investigator or analyst asks whether the case has really been examined from all key points in the diagram.

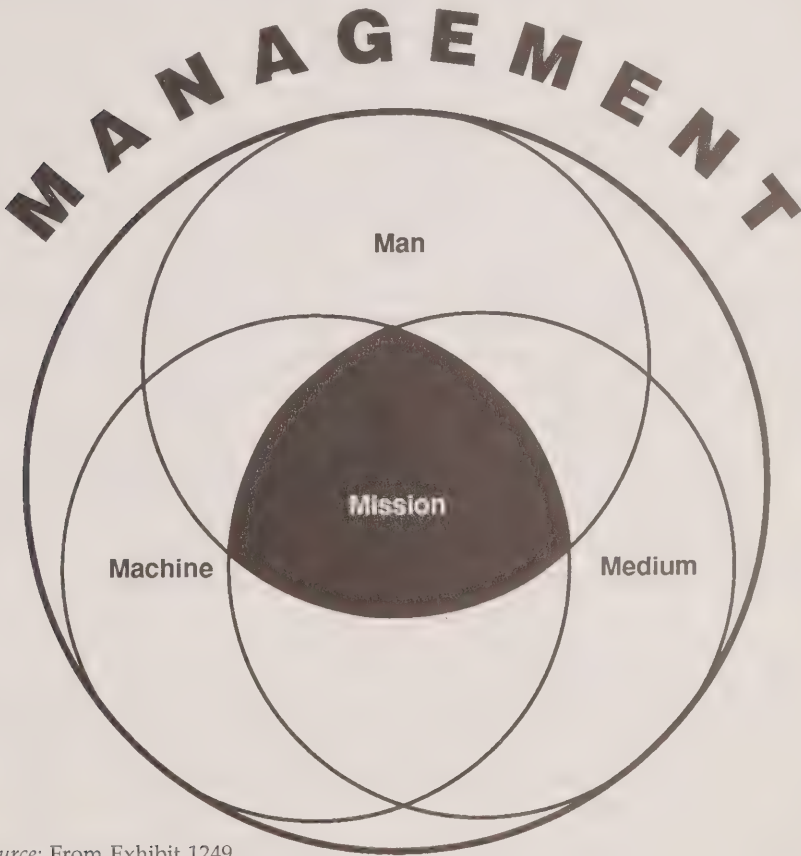
For example, take the infamous 14th Street Bridge air carrier accident near Washington National Airport, January 13, 1982 (NTSB 1982).⁶ The accident occurred under icing conditions. The aircraft struck a bridge less than two miles from start of takeoff roll. The machine came into question because of the aircraft's aerodynamic characteristics with ice-contaminated wings. The captain had quite limited experience in winter flying weather – the man factor. The weather was very snowy with severe visibility restrictions, and another part of the medium (environment) was the airport's relatively short runway.

The man and machine came together at the cockpit instruments where, indeed, the influence of the medium was felt because of ice formation on critical engine thrust-sensing probes, which resulted in a false engine pressure ratio gauge readings (used to set takeoff thrust). The mission came into the equation based on recent airline deregulation, placing economic pressures on the airline and the crew. Management of the situation by the airline in terms of crew assignments, dissemination of icing-effects information, coordination of

⁶ National Transportation Safety Board, *Aircraft Accident Report, Air Florida Inc. Boeing 737-222 ... Near Washington National Airport January 13, 1982* (NTSB AAR-82-8) (Washington, DC 1982)

ground servicing, and the like, was involved throughout the case. So was cockpit management, including the interpersonal relationships between the captain and the first officer. The first officer seemed to sense something was wrong during the take-off roll but never did challenge the judgement of the captain. Even FAA management involvement in the situation was a factor meriting close attention. Their oversight of the airline was minimal, and even the air traffic control procedures the night [evening] of the accident came into question. Most, but not all of these factors were addressed by the NTSB in the study of the accident.⁷

Figure 40-1 System Safety Factors



Source: From Exhibit 1249

⁷ C.O. Miller, "System Safety," in E.L. Wiener and D.C. Nagel, eds., *Human Factors in Aviation* (San Diego: Academic Press 1988), pp. 63-64

While there are some similarities between the 1982 Air Florida crash and the Air Ontario crash of March 10, 1989, it must be stressed that the example is offered only by way of explanation of the investigative and analytical approach that I adopted with this Inquiry.

The pilot-in-command of flight 1363 made a flawed decision, but that decision was not made in isolation. It was made in the context of an integrated air transportation system that, if it had been functioning properly, should have prevented the decision to take off. Instead, it was revealed that there were significant failures, most of them far beyond Captain Morwood's control, that had an operational impact on the events in Dryden. In this chapter, the regulatory, organizational, physical, and crew components of the air transportation system are examined to determine how each may have influenced the captain's decision. Each of these system components is analysed from the perspective of the two previously cited fundamental questions:

- What caused or prompted the pilot-in-command to make the decision to take off?
- What system safeguards should have prevented or altered the decision to take off?

Much of the work in the field of human factors dealing with flight crew performance in operational situations is founded upon the interpretation of data recovered from cockpit voice recorders (CVR) and flight data recorders (FDR). Because neither the CVR nor the FDR information was available after this accident, analysis of flight crew interaction and actions during the station stop in Dryden, and particularly in the final minutes before the crash, is necessarily limited. Nevertheless, the expert witnesses were able to integrate historical data and their wealth of experience with the results of the investigation into the accident to provide possible scenarios of flight crew conduct.

Flight History: Summary

The crew of C-FONF reported in at Winnipeg at approximately 6:30 a.m. Central Standard Time (CST) Monday, March 6, for a five-day block in the F-28 aircraft, involving six flight legs per day ending at 3:30 p.m. CST each day. Captain George Morwood had flown with the two flight attendants before, but none of them had previously flown with First Officer Keith Mills. After flying on Monday, March 6, Captain Morwood was displaced on Tuesday by Captain Robert Nyman and on Wednesday by Captain Alfred Reichenbacher. Captain Morwood rejoined the crew on Thursday and Friday.

On March 10, the crew checked in at Winnipeg at approximately 6:40 a.m. CST and discovered that the auxiliary power unit (APU) was unserviceable. The flight pushed back off the gate at 7:35 a.m., 10 minutes late, and took a further 8-minute delay because Captain Morwood had the aircraft de-iced. The flight was airborne for Dryden at 7:49 a.m. It was further delayed at Dryden by poor weather at Thunder Bay. At Thunder Bay the flight was delayed because of a lack of communication and effective procedures for handling the extra passengers and the resultant need to defuel the aircraft after it had been refuelled. Prior to departure from Thunder Bay, two weather forecasts called for light freezing rain at Dryden. The aircraft departed 64 minutes late, arriving at Dryden at 11:39 a.m. CST. It was refuelled at Dryden with an engine running and with the passengers on board.

During the stop at Dryden, snow was falling and accumulating on the wings. First Officer Mills commented on the aircraft's radio to Kenora Flight Service Station (FSS) at 12:00 noon, "quite puffy, snow, looks like it's going to be a heavy one" (Exhibit 7A, p. 29). Shortly after the aircraft began to taxi, a passenger asked flight attendant Katherine Say when the aircraft was going to be de-iced. The flight attendants did not inform the flight crew of these expressed concerns about the need to de-ice.

The flight was delayed for approximately three minutes while a light aircraft in distress landed. At 12:07 p.m. CST the flight was cleared to Winnipeg, and at 12:09 p.m. First Officer Mills transmitted that the flight was about to take off. The aircraft crashed about one kilometre from the end of the runway.

The Regulatory Component

On March 10, 1989, the crew of Air Ontario flight 1363 was governed by the *Aeronautics Act*, the Air Regulations, and the Air Navigation Orders (ANOs) administered by Transport Canada. Several aspects of the regulations and orders that existed at that time provided an indirect, deleterious influence on the crew's operational environment. Certain regulatory requirements did not ensure the existence of safeguards that might have influenced Captain Morwood's decision to take off at Dryden, given the weather conditions and the aircraft's mechanical defect (the unserviceable APU) and the Air Ontario policy to shut main engines down during de-icing. The following issues are relevant to the regulatory environment:

- Transport Canada did not provide clear guidance for carriers and crews regarding the need for de-icing.

The regulatory requirement that existed at the time of the accident, ANO Series VII, No. 2, section 25(3), prohibited aircraft from commencing a flight “when the amount of snow, frost or ice adhering to the wings, control surfaces or propellers may adversely affect the safety of the flight.” (Based on my first *Interim Report*, ANO Series VII, No. 2, has since been amended to remove a judgemental element in the original order.)

There were no regulatory requirements for training on the effects of aircraft contamination and associated phenomena such as cold soaking. Such requirements are now being considered by Transport Canada.

The information on aircraft icing contained in the A.I.P. Canada: Aeronautical Information Publication, produced by Transport Canada as an aviation reference manual, was very limited. The A.I.P. has since been amended to provide more comprehensive information; however, it contains no information about the cold-soaking phenomenon.

- Transport Canada did not rigorously monitor Air Ontario Inc. for regulatory compliance following its merger and during its initiation of jet service.

Air Ontario operated the F-28 aircraft for a number of months without an approved minimum equipment list (MEL), yet deferred aircraft unserviceabilities to an MEL. Pilots used two different F-28 operating manuals on the flight deck. Neither Piedmont nor USAir authorized the use of these manuals for other than training, and an amendment service was not provided for either manual. These discrepancies were not discovered by Transport Canada, although Transport Canada reviewed and approved the F-28 flight-training program.

- A Transport Canada audit of Air Ontario was delayed and incomplete. It did not address the F-28 operation.

A national audit of Air Ontario was scheduled by Transport Canada for February 1988. While the airworthiness, passenger safety, and dangerous goods portions of the audit were completed as scheduled, the flight operations portion of the audit was deferred and not completed until November 1988. In light of the recent and major changes that had occurred within the company, a thorough examination of flight operations was warranted. It is noteworthy that the audit that was eventually conducted failed to review the most significant operational change within the company, the initiation of jet service with the introduction of the F-28.

- Transport Canada regulations did not require licensing or effective training of flight dispatchers.

Air Ontario operated with what it called a pilot self-dispatch system but employed flight dispatchers in that system to provide flight watch and assistance to flight crew as in a full-dispatch system. Since flight dispatchers were used in the system, it was important that they be properly trained. They were not. Transport Canada had no formal requirements for training and licensing of flight dispatchers.

- The Air Navigation Orders did not contain clear and definitive criteria for the qualification of persons in positions governed by regulations, that is, directors of flight operations, chief pilots, and company check pilots.

- Transport Canada did not have a comprehensive policy for the training and operational priorities of air carrier inspectors.

The rate of turnover within the air carrier inspector ranks resulted in relatively inexperienced personnel being quickly pressed into service with little training for the task. Line checks, which may have revealed anomalies in Air Ontario line operations, were not routinely performed.

- Transport Canada did not have a clear definition as to what constituted an essential airworthiness item. Consequently, this left flight crews and management uncertain at times as to when and under what conditions an aircraft should, or should not, be dispatched.

The evidence revealed that the Minimum Equipment List Order, ANO Series II, No. 20, provided little, if any, guidance to pilots as to what an essential airworthiness item was. Management interpretations of deferred snags or defects were therefore seldom challenged on the basis of stringent regulatory requirements.

In summary, the safety net that should have been provided through safety regulation, air carrier certification, inspection, and ongoing surveillance was lacking in a number of areas on March 10, 1989.

The Organizational Component

A number of Air Ontario's flight operations and overall management practices increased the potential for operational error. At the highest level, Air Canada, despite owning a controlling interest in the company, did not require Air Ontario to operate to Air Canada's operational standards, nor did it monitor Air Ontario operations or provide

resources to achieve these standards. Some significant safety-related deficiencies developed at Air Ontario that may have been prevented or discovered by Air Canada had it taken a more active role in the operational management of its feeder. The focus of discussion in this chapter is not on faulting Air Ontario or Air Canada for not going beyond regulatory requirements; rather, it is to discuss the impact of the organizational setting and practices that were present at the time.

Lack of Operational Support from Air Canada

During the introduction of F-28 service, Air Canada owned a 75 per cent controlling interest in Air Ontario, which was operating under shared (AC) flight designators. Air Canada has had long experience in jet transport operations and in stringent requirements for dispatch and flight following. The resources of this organization would have been valuable in facilitating the merger of Austin Airways and Air Ontario Limited and in initiating the F-28 jet service. According to testimony, there were financial and labour relations reasons for maintaining a separation between the two carriers, and there was no regulatory requirement that obliged the parent company to share resources and impose its standards on Air Ontario.

The Potential Disruptive Impact of Mergers and Strikes

According to Dr Helmreich, research pertaining to crew attitudes and behaviour has been conducted in several airlines that were the result of mergers. As part of the research, crew member attitudes towards flight-deck management were assessed. The data show significant differences in attitudes as a function of previous organizational membership, in one case nearly a decade after a merger. The results clearly indicate the existence of enduring subcultures within organizations. When cultural factors support the maintenance of differing attitudes about the appropriate conduct of flight operations, the effectiveness of flight crew performance is likely to be compromised.

The process of combining seniority lists from merging organizations frequently results in poor relations among crew members from different airlines. The research also indicates that pejorative nicknames are sometimes employed to label crew members from the opposite side of mergers, as indeed occurred within Air Ontario.⁸

⁸ Former Air Ontario Limited pilots referred to their Austin Airways colleagues as "bush pilots," while former Austin Airways pilots referred to their Air Ontario Limited counterparts as "401 pilots" – an allusion to the major highway running from Windsor to Toronto to Montreal.

The data indicate that labour-management strife can have a detrimental effect on crew members' morale and attitudes towards their organizations. There is no doubt that the negative climate fostered by poor pilot-management relations is not conducive to effective team performance. According to Dr Helmreich, relations among pilots and between pilots and management remain poor in some airlines for years after a strike.

In the course of the Air Ontario Limited–Austin Airways merger and in the period leading up to the pilot strike, there was apprehension among and a certain degree of animosity between the flight crews of the two companies. Several witnesses, however, testified that the strike served in some ways as a catalyst in bringing the two pilot groups together in a united front in their approach to management.

Although Captain Morwood and First Officer Mills came from different pre-merger companies and were involved with the strike, the evidence is that their relationship appeared to be normal. There is no evidence before the Commission that the pre-merger corporate subcultures or the pilot strike had any effect on the relationship of the two pilots of flight 1363.

High Personnel Turnover Following the Merger

The period between the merger of the two carriers and the accident saw substantial changes made in personnel. Part of the operation was sold, and the number of personnel in the combined organization was reduced from eight hundred to approximately six hundred. There was also turnover in two critical areas of management, the positions of vice-president of flight operations and director of flight operations. Similarly, the position of safety officer was filled, became vacant because of a resignation, and, after considerable delay, was subsequently refilled. The lack of continuity in management impeded needed supervision of operational issues, including the introduction of the F-28 aircraft and the standardization of operations following the merger.

Lack of Organizational Experience in Jet Operations

Air Ontario as an organization did not have experience in jet transport operations. At the time of the introduction of the F-28, efforts were made to acquire outside expertise in management, and representations to this effect were made to Transport Canada. Ultimately, Captain Claude Castonguay, who had substantial jet transport operational experience (including the F-28), was hired; but he resigned after one month, stating in his letter of resignation: "So much as I would like to keep working to establish your F-28 program, I have concluded that I cannot function in

my duties as a check pilot when I do not get the support I need" (Exhibit 805). His only further involvement with Air Ontario was six months later, when he was called back to conduct line indoctrination training for a very short period of time. No one was subsequently hired from outside the organization to fill this role. Air Ontario elected to manage the F-28 program with internal pilot resources, consisting of pilots with minimal F-28 experience and no previous experience on large jet aircraft.

Deficiencies in System Operations Control Practices

Air Ontario operated with a dispatch and operational control system that consisted partly of full co-authority dispatch and partly of pilot self-dispatch. Although this system was permitted by current Transport Canada regulations, it failed to provide crews with the same level of support and resources as in the parent organization, Air Canada.

In the absence of regulations mandating formal training and licensing for dispatchers, Air Ontario primarily employed on-the-job training for dispatch personnel. For the introduction of the F-28, brief training in the operation of this type of aircraft was provided only for duty managers. In contrast, Air Canada provided its dispatchers with formal training and operational guidelines, including rules that would forbid dispatching an aircraft with an inoperative APU into any station with no ground-start capabilities. That the Air Ontario system was deficient is indicated by errors in flight releases, including erroneous fuel load calculations. Indeed, the flight release for C-FONF contained such errors on the day of the accident. Further, the failure to accommodate for forecast freezing rain in Dryden on March 10, 1989, represented another deficiency within Air Ontario system operations control (SOC).

Lack of Standard Operating Procedures and Manuals for the F-28

Revenue passenger service was initiated without a specific Air Ontario operating manual for the F-28. There was also no approved minimum equipment list for some months after passenger service began. There were inconsistencies between cockpit manuals and between cockpit and cabin manuals provided to crew members. For example, the flight attendant manual required passenger disembarkation for refuelling with an engine running, but there was no parallel rule in the flight operations manual or the aircraft operating manual. Crews thus lacked standardized operational guidelines either from manuals available on the flight deck or from SOC.

Inconsistencies/Deficiencies in Training F-28 Flight Crew Members

Initial training of F-28 flight crew members, including both ground school and simulator training, was contracted with Piedmont Airlines. Piedmont itself was involved in a merger with USAir, which decided to achieve standardization of the merged operation by shifting all former Piedmont personnel to USAir procedures and manuals. There were several implications of this merger for Air Ontario flight crews. Some crew members received training from the Piedmont F-28 manual, and those training later worked with the USAir manual. Since Air Ontario had not developed its own manuals, some individuals returned from their training sessions with the Piedmont manual and others with that of USAir. Although Air Ontario management witnesses stated that the Piedmont manual was its standard, this was not clearly communicated to crews, and no efforts were made to provide all crews with the same manual. Air Ontario also failed to arrange an amendment service for the manuals it was using. Although the Fokker F-28 Flight Handbook was carried in the aircraft, there was limited training in the use of this manual; and there were variances between the Fokker and Piedmont manuals – for example, in computing corrections for runway contamination.

Another result of the Piedmont/USAir merger was that the Piedmont F-28 flight simulator was not available for the training of Air Ontario flight crews. Because of this, a number of Air Ontario F-28 pilots were trained in the aircraft itself, by newly qualified Air Ontario F-28 training pilots, rather than in the Piedmont simulator. There is consensus in the industry that a flight simulator provides broader and more effective flight crew training.

Fight crew members surveyed by the Air Ontario safety officer following the accident generally reported their line indoctrination at Air Ontario to be “fair” in quality. One deficiency noted was a failure to define clearly the duties of the pilot flying and the pilot-not-flying, indicating a weakness in training and in flight-deck operating procedures.

Leadership of the F-28 Program

Captain Joseph Deluce was simultaneously the F-28 project manager and the chief pilot for both the F-28 and the Convair 580 aircraft. Captain Deluce had numerous responsibilities, including line flying during the strike that preceded delivery of the F-28 aircraft and conducting flight

training and line indoctrination in the F-28 for new crew members. Captain Deluce, in addition to being overloaded with responsibilities, had limited operational experience on both the F-28 and the Convair 580 aircraft.

One incident that may have had a significant impact on the attitudes of crew members was the removal of an F-28 flight crew from a line trip to meet with the chief pilot, Captain Joseph Deluce, for allegedly writing up too many maintenance discrepancies in the aircraft journey logbook. One can easily understand how other F-28 pilots might interpret this event as a lack of leader support for optimal operating conditions and as strong pressure to operate at all costs.

The Informal Culture at Air Ontario

During the period of initiation of F-28 service at Air Ontario there was lax regulatory supervision, high management turnover, a self-dispatch system with SOC personnel who lacked knowledge of the F-28 and were generally inexperienced, and a lack of clearly specified and enforced standard operating procedures. Some crews, instead of entering mechanical problems or snags in the aircraft journey logbook, wrote them on loose pieces of paper and passed them on to relieving crews, thus permitting deferral of maintenance and avoiding the grounding of aircraft.

Another non-standard procedure was the "80-knot check," a visual examination of the wing surfaces during takeoff to ensure that contamination had blown off prior to rotation. Captain Deluce, who had been involved in at least two earlier reported incidents involving take offs with snow- or ice-contaminated surfaces that resulted in emergency landings, contributed to this lax attitude at Air Ontario. These examples suggest that crews may have been allowed considerable leeway in making decisions about whether to take off with surface contamination, a practice that, unfortunately, was not unequivocally proscribed by the then current Transport Canada regulations.

Former Austin Airways pilots, including Captain Joseph Deluce, who formed a large part of the leadership in Air Ontario flight operations management, were branded as "bush pilots" by former Air Ontario Limited pilots. No doubt the name refers to the roots of Austin Airways in charter and cargo operations in Northern Ontario and Quebec. The term is not necessarily pejorative. Some former Austin Airways pilots, for example Captain David Berezuk, were quite proud to describe themselves as bush pilots; in fact, the term can connote ability to fly

safely in particularly harsh operating environments with a certain independence and self-reliance and with a willingness to make every effort to complete a flight.

I read with great interest a special study of the National Transportation Safety Board (NTSB) on air taxi safety in Alaska, in which "bush pilot syndrome" was described:

[S]tatements from operators, pilots, and regulatory personnel in the Alaskan aviation community suggest that the "bush pilot syndrome" may be an integral factor not only in high pilot involvement but also in the high accident rate in Alaska.

Descriptions of the "bush pilot syndrome" range from a pilot's casual acceptance of the unique hazards of flying in Alaska to a pilot's willingness to take unwarranted risks to complete a flight. In Alaska it is not uncommon for pilots to fly in extremely poor weather or to attempt to land on runways that are in bad condition or off the airport on snow-covered strips or frozen lakes marginally suited for landing. Stories abound about pilots who have been involved in numerous accidents and have survived. These pilots have become near legends and are spoken of almost reverently by some young pilots ... Taking chances is considered a part of flying in Alaska by many Alaskans – not just the pilots, but also the passengers. Passengers affected by the "bush syndrome" demand to fly even in hazardous weather conditions, and if one pilot or operator will not fly, the passengers will go to another operator; occasionally they find one who will fly in hazardous weather conditions.

The "bush syndrome" goes beyond the realm of poor judgment compounded by pressures and into the area of unreasonable risk-taking. Although the "bush syndrome" apparently exists, it cannot be unequivocally demonstrated by statistical data. However, it is clear that most operators, pilots, and others associated with Alaskan aviation believe that it does exist. The review of accident cases further supports the contention.

...

Although the pilot is cited in a higher percentage of air taxi accidents in Alaska, that statistic does not tell the entire story and may even be misleading. The Safety Board determinations of detailed cause/factors in air taxi accidents in Alaska were compared with the determinations for accidents in the rest of the United States. This comparison indicated that when the pilot was cited as the broad cause/factor, several detailed cause/factors pointing to two general problem areas frequently appeared. These problem areas are: (1) inadequate airfield facilities and inadequate communications of

airfield conditions, and (2) inadequate weather observations, inadequate communications of the weather information, and insufficient nav aids.⁹

These NTSB observations were echoed by Mr Martin Brayman of Transport Canada, when he testified about the northern environment within which Austin Airways operated. Mr Brayman was shown the accident statistics for a number of carriers, including Austin Airways, that operated in northern and remote regions. In discussing the accident rates of these carriers, he stated that there is "a direct relationship between the number of accidents or incidents that a carrier has and the condition under which the carrier operates" (Transcript, vol. 131, p. 63). He pointed out that in northern Canada, in mountainous areas like British Columbia, in northern Quebec, and in the Arctic there are a number of factors that have to be taken into account with respect to operations.

Mr Brayman expressed his opinion with respect to the element of risk involved in the hostile environment of northern operations:

- A. ... there is no question that in remote areas where the population demands a reasonably high level of air service, and in Canada, our native peoples surely do that, the carriers are hard-pressed often to meet those demands.

You are working in areas of bad weather, poor runways, little in the way of runway markings or approach aids, weak beacons often covered with ice. So ... it is a hostile environment.

And if you take it even further to operations that extend out onto the sea ice, for instance, a lot of the northern operators land and take off from frozen lakes, from frozen sea ice, they touch down on frozen cracks in the sea ice. There is no question there's an element of risk.

(Transcript, vol. 131, pp. 63-64)

He elaborated on the difficult conditions habitually faced by pilots in northern operations:

- A. You are getting in an area that has a paucity of aids to the pilot. You are dealing with basic single runway strips. You are dealing with heavy snowfalls, high snowbanks, drifting snow,

⁹ National Transportation Safety Board, *Special Study: Air Taxi Safety in Alaska* (Washington, D.C.: September 16, 1980), pp. 19-20

white-outs. It's a very difficult area to fly in successfully. Extremely cold temperatures, heavy icing during transitional periods, spring and fall. Yes, it's a very, very difficult area to fly in.

(Transcript, vol. 131, p. 65)

One can easily imagine how the message communicated during training, and in the Fokker manual for the F-28, that no snow, ice, or frost should be present on wings, may have been discounted to some extent by crews who had successfully operated (albeit in different types of aircraft) with some degree of contamination. Combined with a "bush culture" which was attributed to much of the operational management of Air Ontario, this tendency would not have been properly checked by the F-28 chief pilot or the director of flight operations. In all likelihood, the permissive management environment at Air Ontario probably exacerbated such non-standard operational practices.

Additionally, the Transport Canada air carrier inspector appointed for the F-28 fleet, who was relatively inexperienced in the aircraft, may not have been in a strong position to impose appropriate standards.

Maintenance Problems with the F-28

A number of maintenance problems were encountered with the F-28. These were exacerbated by a lack of familiarity with the aircraft on the part of maintenance personnel and a shortage of spare parts. The journey log for the accident aircraft, C-FONF, listed a number of problems between June and December 1988, many of which were deferred for extended periods. These included earlier problems with the auxiliary power unit (APU) in August and October 1988. On several occasions in 1989 the cabin filled with smoke while passengers were aboard, and, in the week of the crash, the aircraft experienced cabin pressurization problems.

On the day of the accident, C-FONF was dispatched with an unserviceable APU and had three other deferred maintenance items, including roll and yaw in the autopilot and a fuel gauge that read intermittently. Other discrepancies that were brought to the attention of the flight crew by the cabin crew prior to the first flight on March 10 were inoperative exit lights, dim cabin emergency floor lighting, missing oxygen masks, and problems securing the main door handle because of a missing clip. Though these items, with the exception of the APU, do not have an appreciable safety significance, they reflect a haphazard maintenance philosophy that can result in accidents.

Flight Attendant Training

Flight attendant training at Air Ontario did not encourage flight attendants to bring operational issues to the attention of the flight deck or to question matters pertaining to flight operations. Training stressed the competence of pilots and fostered a position of total reliance on the flight crew. Two examples that demonstrate a separation of cabin and flight deck can be seen on the day of the accident: the hot refuelling of the aircraft in Dryden that was at variance with the flight attendant manual, and the failure of the flight attendants to relay passenger concerns about de-icing to the flight deck. In contrast to this lack of crew communication, the concepts taught in crew resource management stress the importance of complete information exchange between the flight deck and the cabin.

The Physical Component

A number of negative factors were present in the physical environment facing the crew on March 10. These included an aircraft with mechanical problems, no F-28 ground-start equipment in Dryden, poor weather with snow and freezing precipitation throughout the area of the flight, and a change in the passenger load in Thunder Bay that required an unplanned defuelling of the aircraft.

The Aircraft, C-FONF

The operations officers in Air Ontario SOC and the flight crew knew that the APU of aircraft C-FONF was unserviceable on the day of the crash. Mr Martin Kothbauer, the SOC duty manager, had even sent a message to Winnipeg, Thunder Bay, Dryden, and Sault Ste Marie to advise that C-FONF was operating without a serviceable APU and to ensure that the agents had the F-28 ground power and air start equipment ready. The message also stated that if air starts could not be provided, SOC was to be advised so it could set up hot refuelling. It was not determined what steps SOC would have taken to set up hot refuelling, if it was required, but Dryden had no F-28 start equipment, and there is no evidence that anything was done by SOC with regard to hot refuelling in Dryden.

There were other minor unserviceabilities on the aircraft that day, but none of them in isolation would pose a concern for any of the air crew. The accumulation of the unserviceabilities probably were frustrating for them.

The Weather

The weather conditions throughout the scheduled routing area of Air Ontario flights 1362 and 1363 were poor during March 10, 1989, and created complications for Captain Morwood. At Winnipeg he had the aircraft de-iced because it had frost on it, thereby causing the first delay of the day. Subsequently, because the weather at Thunder Bay was below published landing minima, flight 1362 was delayed on the ground in Dryden while it waited for the weather in Thunder Bay to improve. The alternate airport for all of the flight legs was Sault Ste Marie, rather than the normal closer alternates, which meant that more fuel had to be carried and that more attention had to be paid by the flight crew to the weather en route, at each destination and alternate airport, and to aircraft takeoff and landing weights. There was freezing precipitation, occasional freezing precipitation, or the risk of freezing precipitation forecast for all of the terminals in question, but the flight crew's knowledge of the implications of this forecast is not known. With regard to the operation of flights 1362 and 1363, there is no evidence that the forecast of freezing precipitation altered or otherwise played a part in Captain Morwood's decisions or in any of the decisions of the SOC personnel.

The weather in Dryden during the stopover of flight 1363 deteriorated from a VFR day with a ceiling of 4000 feet and visibility of 12 miles at landing to a low IFR day with the weather report at 12:06 p.m. CST, three minutes before the start of the takeoff roll, indicating a ceiling of 300 feet and visibility of three-eighths of a mile in snow. The lowest condition forecast for Dryden for the period of the flights was occasional ceiling 700 feet broken and visibility two miles in light rain and fog. The lowest condition forecast for Dryden in the forecast issued at 1630Z (10:30 a.m. CST and 11:30 a.m. EST), and available to the flight crew in Thunder Bay before takeoff for Dryden, was a broken ceiling at 3000 feet and visibility five miles in light rain, light freezing rain, and fog. This was the latest and last forecast issued for Dryden prior to the crash. There is evidence that SOC did not note the mention of freezing precipitation and that SOC did not pass the forecast to the crew of flight 1363.

The low ceilings and visibility encountered by the flight crew when they were preparing for the takeoff from Dryden may have surprised them somewhat. However, Canadian commercial pilots encounter poor weather conditions many times in their careers, and, for the most part, they accept poor weather as part of their job. Inevitably, though, poor weather conditions put extra pressures and workload on pilots both in flight planning and in flying the aircraft.

Activities in Thunder Bay

A number of decisions imposed by SOC resulted in flight 1363 falling further behind schedule. The decision to defuel in Thunder Bay after the aircraft had been refuelled, in order to take on board eight extra passengers, had an impact on the flight crew in many ways. The defuelling caused a further delay of 35 minutes in the departure, and Captain Morwood particularly disliked being late. Captain Morwood and First Officer Mills had to recalculate the takeoff and landing data to accommodate the increased passenger load and reduced fuel load. Captain Morwood's authority as the pilot-in-command, within Air Ontario's hybrid pilot self-dispatch and full co-authority dispatch system, to operate the flight as he deemed necessary with regard to fuel and passenger loads was effectively usurped by SOC in London, in that the SOC solution to the aircraft overweight condition (to defuel, rather than to off-load passengers) prevailed.

After the decision had been made to defuel the aircraft, both Captain Morwood and First Officer Mills got off the aircraft. Captain Morwood spoke to Mr Gary Linger, the owner of ESSO Flight Refuelling at the Thunder Bay airport and the person who defuelled the aircraft, and they discussed the amount of fuel to be taken off. During his testimony, Mr Linger described Captain Morwood in words such as "calm," "very professional," and "apologetic," in that Captain Morwood said to him: "Sorry to bring you down here again" (Transcript, vol. 56, pp. 82–89).

Flight attendant Sonia Hartwick testified that during the Thunder Bay station stop the crew were "becoming very frustrated." This frustration was expressed verbally and, in Mrs Hartwick's opinion, resulted from a combination of things that had happened earlier in the week and were happening to them in Thunder Bay. In testimony she stated:

- A. They were ... becoming very frustrated. They felt like we were all being ignored. No one was coming to our rescue. We sat there and we were actually delayed one hour in Thunder Bay.
- Q. As a matter of fact, did the captain to the best of your recollection make a bit of a comment that you recall?
- A. Well, he was very upset. He may have swore and said God damn it like this but ...
- Q. He felt ignored, didn't he?
- A. We all felt ignored. Passengers had connections to make in Winnipeg and we were delayed a total of an hour in Thunder Bay. So, we were worried about them as well.
- Q. Did you find that First Officer Mills felt slightly ignored and annoyed as well?
- A. Yes, they both –

Q. They both were?

A. Yes, they were.

(Transcript, vol. 10, pp. 191–92)

While Captain Morwood's frustration may not have been evident to Mr Linger, it was certainly evident to flight attendant Hartwick during discussions among the crew members. Although it is not conclusive from the evidence whether Captain Morwood's frustration influenced his decision making at Thunder Bay, it may well have manifested itself as a factor both in any consideration that should have been given to the option of overflying Dryden on the return leg to Winnipeg, having regard to the forecast freezing rain, and in the decision not to de-ice the aircraft with no operable APU and no ground-start facilities at Dryden.

The Crew Component

A number of factors present among the crew of the accident flight have been identified through research in other organizations as significant stressors that can serve to reduce flight crew effectiveness. These include situational factors surrounding the operation of the flight as well as characteristics of individual crew members.

Situational Factors

Crew Members' Knowledge and Training

Captain Morwood and First Officer Mills each had fewer than 100 hours of flight time on the F-28 aircraft. After completion of ground and simulator training at Piedmont, Captain Morwood returned to flying the Convair 580. His line transition to the F-28 was further delayed by the Air Ontario pilots' strike. The delay in reinforcing Captain Morwood's training on the line could have rendered him less effective initially. First Officer Mills received all of his training in the aircraft rather than the simulator. The lack of opportunity to use the simulator to acquire F-28 skills and confidence, particularly with respect to practising abnormal or emergency situations, could have affected First Officer Mills's ability with regard to abnormal and emergency situations on the F-28.

There is growing concern in the industry, based on several recent accidents in the United States, about the safety implications of pairing crew members new to an aircraft soon after completion of line indoctrination. It takes a significant amount of flight time to become comfortable with a new aircraft, particularly one substantially different from prior equipment. One of the basic premises of the crew concept of flight operations is that crew members support each other in safe and effective flight management. When both crew members are still becoming familiar

with the aircraft, the margin of safety is reduced. Efforts are under way in the United States to require newly qualified crew members to be scheduled with more experienced crew members for some time following completion of their initial operating experience (a mandated period after initial training of flying with a company check pilot while gaining familiarity with the aircraft in line operations). In that regard, the evidence of Captain Gert Andersson, a highly experienced pilot with Linjeflyg, a Swedish carrier flying F-28 aircraft in Europe, is worth noting. According to Captain Andersson, the Linjeflyg computerized crew-scheduling program precludes the scheduling of an inexperienced captain with an inexperienced first officer (Transcript, vol. 83, pp. 158–60). The crew-pairing problem caused by the introduction of a new aircraft type is, in my view, best addressed by bringing in outside expertise, as Air Ontario initially represented it was doing by hiring Captain Claude Castonguay, to support training, line indoctrination, and general flight operations until such time as company pilots have obtained the requisite experience levels to be paired together. Captain Castonguay, however, resigned after one month, citing lack of support by Air Ontario management.

Organizational Background and Experience Working Together

Several additional issues made the pairing of Captain Morwood and First Officer Mills potentially stressful. One was the fact that Captain Morwood came from Air Ontario Limited while First Officer Mills came from Austin Airways. Additionally, both men had been operating as captains in their prior aircraft. Individuals accustomed to acting as pilot-in-command have been noted to function less effectively when paired with one another, in that a captain wants to be a captain. A concern in that regard was expressed in evidence by Captain Erik Hansen, an Air Ontario F-28 pilot. He had no difficulty with the competence of First Officer Mills, but found that First Officer Mills had a tendency to make decisions that were not his to make (Transcript, vol. 94, p. 87). These factors, combined with the lack within Air Ontario of enforced standard operating procedures, including the noted failure to specify pilot-flying/pilot-not-flying duties in flight-training line indoctrination, could well have reduced the effectiveness of this crew as a team (Exhibit 744).

The week of March 6 to March 10, 1989, was the first time that Captain Morwood and First Officer Mills had flown together, and Captain Morwood was displaced by other captains for two days. At the time of the accident, their total time flying as a crew was just over two days. According to Dr Helmreich, experimental simulation research conducted by NASA-Ames Research Center found that crew

coordination and effectiveness are significantly increased by the simple fact of working together as a team.

Delays and Stresses Imposed by the Operating Environment

The initial flight segment on March 10 was delayed because the aircraft was de-iced in Winnipeg. As noted, there were also deferred APU unserviceability and minor mechanical problems with C-FONF. In a radio communication shortly after takeoff from Winnipeg, Captain Morwood commented, "everything else seems to be going wrong today" (Exhibit 375). Upon arrival at Dryden, flight 1362 was held on the ground for some 20 minutes while it waited for Thunder Bay weather to improve. Because of defuelling in Thunder Bay, departure from Thunder Bay was more than an hour behind schedule.

At Dryden, it was necessary to refuel flight 1363 with an engine running. It is not known why the passengers were not disembarked at Dryden during the hot refuelling. During the refuelling, snow was falling. As Captain Morwood had fewer than 100 hours in the aircraft type, he was required by Air Ontario policy to have higher takeoff weather limits than a more experienced pilot on type would have had. He may have been concerned that the visibility would be below his limits prior to departure. The flight was already running late, and a number of passengers had tight connections in Winnipeg. After the aircraft taxied for departure, a final delay of approximately three minutes was incurred waiting for the arrival of a Cessna 150 that was experiencing difficulties because of the poor weather. There is little doubt that the continual delays and problems encountered throughout the day added frustration and stress to the overall operation of flight 1363.

Personal Factors

Fatigue and Mood

The term acute fatigue is used to indicate short-term fatigue, such as the result of losing a night's sleep, while the term chronic fatigue is used to indicate long-term fatigue, such as the result of working long hours for an extended period of time. Acute fatigue is considered less serious because it can be relieved relatively easily, whereas chronic fatigue cannot. Further, acute fatigue is usually recognized by the person experiencing it, whereas chronic fatigue can be insidious because of a failure of the person involved to recognize it.

A review of the work schedules for Captain Morwood, First Officer Mills, and flight attendants Say and Hartwick for the period January 1, 1989, to March 10, 1989, indicates that none of them, based solely on

their work schedules, should have been suffering from chronic fatigue. They had days on duty and days off duty as follows: Morwood 31/38, Mills 39/30, Say 35/34, and Hartwick 33/36. Their flying schedule for the week of March 6 to 10 started each day at 7:30 a.m. and ended at 3:30 p.m.

The days on and days off, and the duty period each day are well within all of the maximum duty times for the flight crew (pilots) as specified in ANO Series VII, No. 2, section 41.1. While the flight attendants were also within the maximum duty times for flight crew, there are no regulatory requirements in the ANOs or elsewhere regarding maximum duty times for flight attendants. There was no evidence to indicate that any of the crew members were experiencing the effects of chronic fatigue.

There is some evidence that Captain Morwood, First Officer Mills, and flight attendant Say may have been experiencing mild acute fatigue. Flight attendant Hartwick stated in testimony that Captain Morwood had said in conversation that he had tossed and turned all week and was getting phone calls that interrupted his sleep. She also stated that Mrs Say had complained about her lack of sleep. First Officer Mills had complained that he had too much coffee, presumably a reference to his inability to get a good night's sleep (Transcript, vol. 10, pp. 156–58). Mrs Hartwick had had no difficulty sleeping and was not tired. "I was sleeping like a log. I got to bed really early that whole week, and I just bugged them [other crew members] about that" (Transcript, vol. 10, p. 158).

Mr David Adams, in testimony, discussed the investigation into possible fatigue of the crew:

- A. We collected as much information as was reasonably available in terms of what their duty times were, flight times, what their personal activities were in the week preceding the accident. We tried to determine where they had meals, what time they went to sleep, how many interruptions they went through during the evening, so on and so forth.

And basically ... it's my opinion, that we exhausted all of those avenues of information.

The information basically told me that Katherine Say, First Officer Mills and Captain Morwood were all probably suffering some degree of mild acute fatigue.

The next step was to try and relate that condition, if it did probably exist, to the sequence of events leading to the accident. And I was not able to do that, other than to make the observation that one of the empirical findings of fatigue is an increased reporting of their subjective feelings of irritability by people who are fatigued.

And I made the comment that if, in fact, this was the case, it may have contributed to Captain Morwood's feelings of frustration.

But as far as I'm concerned, we exhausted the issue with the available information in this accident.

(Transcript, vol. 159, pp. 184–85)

Dr Helmreich commented on Mr Adams's testimony as follows:

- A. I think Mr Adams put it perfectly. I certainly feel that the issue of fatigue is an important current research topic and it's one that's being investigated in a number of places. But I simply don't see it as having relevance to the scope of this Inquiry.

(Transcript, vol. 159, p. 185)

The crew, according to flight attendant Hartwick, were in good humour throughout the week they flew together. When asked during her testimony about the mood of the crew members on March 6, the first day of their week's flying, she said, "They were in a very good mood ... They were happy, in fact, because they would be starting holidays the following week, so they were very happy" (Transcript, vol. 10, p. 134). Mrs Hartwick used the same type of words to describe the mood of the crew members each day that week. However, she did state that they were frustrated at times because of the defects on the aircraft and, particularly during the stop in Thunder Bay on March 10, 1989, with the delay and confusion regarding the extra passengers and defuelling.

Toxicology Results

Toxicological testing was completed on all of the deceased passengers and crew. The results for the crew members showed no evidence of alcohol or drugs. The results for flight attendant Say showed an elevated level of hydrogen cyanide in her blood. This finding is considered to be the result of inhalation of toxic gases that may be generated during the combustion of aircraft materials.

Captain George Morwood

Captain Morwood received 22 hours of F-28 simulator training following his initial ground school in 1988 and a further 8 hours 20 minutes during his recurrent training in 1989. At the time he commenced flying the F-28 as a line captain he had accumulated a total of 29 hours aircraft time, which included 27.5 hours of line indoctrination and 1.6 hours aircraft training. All of his check rides during training were well flown, and he received nothing but satisfactory comments on his training and check ride reports. At the time of the crash, Captain Morwood had 81 hours

on the F-28. I conclude that Captain Morwood was properly trained to fly the aircraft.

According to his record and the evidence of his peers, Captain Morwood was considered above average as a professional pilot. He had shown not only a concern, but a dogged determination in his pursuit of safety issues in his prior management positions. Captain Morwood during his F-28 training at Piedmont Airlines had been exposed to and was aware of the effects of icing on the F-28, including those caused by differential temperatures of fuel and ambient air. It should be noted, however, that, despite the best efforts of Commission staff, no direct evidence was found that either Captain Morwood or First Officer Mills was fully conversant with the cold-soaking phenomenon and its potential effect with respect to aircraft contamination.

The evidence of another senior Air Ontario captain, Mr Erik Hansen, who attended both the initial and the recurrent F-28 ground school with Captain Morwood, was that the sensitivity of the F-28 wing to contaminants was covered very thoroughly by Piedmont instructors. These same instructors, in response to Captain Morwood's questioning, insisted that the wings not only be clean for takeoff, but that they be "super clean" (Transcript, vol. 94, pp. 70-74).

Captain Hansen's evidence suggests that some Air Ontario Convair 580 pilots were not particularly concerned about wing contamination on that aircraft and that they had previously taken off with some contamination adhering to the aircraft. Captain Morwood may well have been one such pilot. He was reported by his colleagues to be a by-the-book pilot and, by Captain Hansen, "a proverbial instructor" when flying on the line (Transcript, vol. 94, p. 101). Another colleague described him as being "a little condescending," as coming from "the old school where the captain is the captain and the first officer is the first officer," and that he "wasn't quite as tied into the modern concept of the team concept" (Transcript, vol. 92, p. 61). In theory, this characteristic could have been an annoyance to highly experienced junior crew members such as First Officer Mills, who had considerable experience flying as a captain. Evidence from the surviving flight attendant and a company employee who occupied the flight-deck jump seat during the previous leg indicates, however, that the two pilots were getting along well together and were both in good moods.

Evidence from several witnesses shows that Captain Morwood had a strong commitment to on-time operations and a high level of concern for his passengers. A number of passengers had connecting flights in Winnipeg on March 10. Some of these passengers had expressed their concerns about missing their connections to the flight attendants, who in turn passed the concerns to the flight crew. In addition, Captain Morwood had a personal trip scheduled for the following day out of

Toronto. These factors could have heightened his motivation to complete the scheduled flying as near as possible to the schedule.

First Officer Keith Mills

First Officer Mills completed 8.3 hours of training and a 1.2-hour pilot proficiency check on the F-28 aircraft in February 1989; he did not have the opportunity to train in the simulator. He flew 20 hours of line indoctrination and then, with 29.5 hours on the aircraft, began duties as an F-28 first officer. His F-28 training and check ride reports, although incomplete, indicated that his training was satisfactory, although there were some elements of the training that were considered satisfactory only after debriefing.

First Officer Mills had a record of some difficulties with the aircraft-handling aspects of flying, but he met all regulatory requirements for competence. The fact that he did not receive simulator training in the F-28, along with Captain Morwood's long experience and reputation as a perpetual instructor, may have made First Officer Mills somewhat reluctant to practise optimal crew resource management concepts and to provide operational suggestions to Captain Morwood. First Officer Mills also had scheduled personal plans for the next day.

Flight Attendants Katherine Say and Sonia Hartwick

There was only one flight attendant activity that could have had a bearing on the captain's decision to take off: the flight attendants' going to the flight deck and expressing their concerns and those of the passengers regarding the accumulation of snow on the wings of the aircraft. Flight attendant Hartwick testified that she had heard passengers expressing their concerns about the accumulating snow, and she heard Special Constable Dennis Swift discussing the subject with flight attendant Say. Special Constable Swift, in testimony, corroborated Mrs Hartwick's testimony. Flight attendant Hartwick did not talk to the flight crew about the snow on the wings, and the evidence is overwhelming that flight attendant Say did not do so either. Cabin crew members are often reluctant to discuss operational problems with flight crew, as discussed in detail in chapter 39, Crew Coordination and Passengers' Safety Concerns.

Passengers and Ground Crew

There were two professional pilots on the flight as passengers, Captain David Berezuk and Captain Murray Haines. Although during their testimony they both stated they were very concerned about the buildup of contamination on the wings, neither of them, for their own reasons as discussed in chapter 39, passed his concerns to the cabin crew or the

flight crew. Two ground personnel, Mr Jerry Fillier and Mr Vaughan Cochrane, could have had an influence on the captain's decision to take off, although the accumulation of snow on the aircraft was not as great while the aircraft was at the ramp as it was later while the aircraft waited to take off. Mr Cochrane talked to the flight crew when he went to the flight deck to pass on information about the baggage, again when he passed the information about the fuel upload, and when he was asked by the captain about the availability of de-icing. There was some evidence that ground personnel are also reluctant to approach flight crew with operational concerns because of the fear of a rebuff, a cause for embarrassment.

The Situation on March 10, 1989

The picture that emerges from examination of the regulatory and organizational environments in which this crew was operating is one of an array of factors that served to undermine crew effectiveness and to increase their level of stress. I believe that none of these factors in isolation is likely to cause an accident – as evidenced by the fact that the F-28 was operated without an accident for several months prior to March 10. However, when these seemingly unrelated factors were combined with the particular conditions of the physical environment, the margin of safety was clearly reduced. Factors in the crew environment such as the operational unfamiliarity of the crew with each other and the aircraft, combined with absence of clear understandings with respect to communication within the crew, no doubt exacerbated the situation.

Operational Stressors

In considering the crew's actions on March 10, the operational factors that may have caused them stress should be reviewed. According to research in the field of human performance, psychological stress can serve to reduce individual and team effectiveness, especially in the areas of interpersonal communications and coordination and in decision making. Relevant classes of stressors include time pressure and frustrations associated with inadequate resources and suboptimal operating conditions. Captain Morwood and First Officer Mills faced a number of these conditions during March 10. It may provide a useful context for the situation at Dryden to summarize them.

- On accepting the aircraft in Winnipeg, the flight crew found the APU to be unserviceable. As noted previously, there were three more deferred maintenance items, as well as other items in the cabin that were reported by the flight attendants.

- The weather conditions throughout the region forced an initial delay for de-icing and the adoption of a more distant alternate, with a consequent requirement to carry additional fuel. Conditions also required the crew to be continually concerned about the weather.
- It was necessary to hot refuel during the stop in Dryden.
- The necessity to keep an engine running may have triggered concerns because of company policy, and a stated requirement in the Fokker Publication on Cold Weather Operation, that the aircraft could not be de-iced with the engines running.
- SOC dispatched the flight with a clearly erroneous flight release. It may have been a source of concern for the crew to have been dispatched with no explicit accommodation for the unserviceable APU under conditions of freezing rain.
- Both crew members had fewer than 100 hours in the F-28. In addition to the stress imposed by lack of familiarity with the aircraft, Captain Morwood had more restrictive company takeoff and landing weather limits because he had less than 100 hours on the aircraft type.
- The flight was delayed on its initial stop in Dryden because Thunder Bay weather was below Air Ontario landing limits.
- A major delay occurred in the departure of flight 1363 from Thunder Bay.
- There was considerable confusion surrounding the loading of additional passengers in Thunder Bay, and, after the aircraft had been refuelled, the need then to defuel the aircraft to meet weight restrictions. The defuelling added a further delay of 35 minutes to the already delayed flight.
- The crew had difficulty in Thunder Bay in obtaining assistance from Air Canada during the station stop.
- As the flight landed in Dryden, snow began to fall, with the intensity of the fall increasing during the stop. At the time of takeoff, the actual visibility was below the captain's takeoff minima.
- The date of the accident was the beginning of the March school break, and the aircraft was full. A number of passengers had flight connections to make in Winnipeg. If the connections were to be made, further delays, such as would have been necessitated by de-icing of the aircraft, could not likely be tolerated.
- Flight 1363 left the ramp at Dryden just over an hour behind schedule, only to be further delayed by the Cessna 150 that was caught in the snow storm.

While none of these issues alone can be considered an overwhelming stressor, taken together they indicate a taxing operational environment.

From the perspective of hindsight, it is likely that a change in any one of a number of conditions might have interrupted the sequence of events that led to the accident. The following four examples illustrate the point:

- A more stringently regulated and managed dispatch system should have precluded operations into Dryden on March 10, or at least on the return from Thunder Bay.
- A more stringent regulatory requirement and a mandatory training program on the effects of contamination, including the cold-soaking phenomenon, may well have created a greater sensitivity on the part of the flight crew to the potential for degraded airfoil performance.
- An effective training program in crew resource management could have resulted in a review of the operational situation involving both pilots and led to a critical evaluation of the appropriateness of the decision to take off without de-icing.
- Similarly, training that encouraged cabin crew members and ground support personnel to share operational concerns with flight crews and encouraged pilots to listen to such concerns might also have triggered further consideration of the implications of contamination on the aircraft.

The issues discussed in preceding sections have an empirical basis as significant influences on flight crew behaviour, but a weighting of each issue as a determinant of the outcome of flight 1363 cannot be made from the available record. Nor can the decision processes surrounding the takeoff from Dryden be specified in the absence of cockpit voice recorder evidence. However, considering the four components affecting crew behaviour, the regulatory, organizational, physical, and crew components, it is possible to construct a likely scenario for the crew's actions. It must be stressed that this scenario represents an after-the-fact reconstruction from the available evidence.

A Scenario for Crew Decision Making in Dryden

In retrospect, the operation into Dryden on the return from Thunder Bay, without a functioning APU and already behind schedule, is questionable. Certainly, making the stop would minimize passenger disruption. An alternative was to leave the extra passengers in Thunder Bay, carry additional fuel, and proceed directly to Winnipeg. The evidence of Captain Erik Hansen, an Air Ontario F-28 captain, is revealing:

- A. And the only thing I don't understand is why George decided to defuel in Thunder Bay to accommodate more passengers, because he was already late, I understand.

And what I would have done differently was I would have told these passengers that just the space wasn't available. There are weight penalties, obviously. He had fuel to go all the way through to Winnipeg.

Later in the same discussion:

- Q. Supposing the decision in Thunder Bay to take on these passengers was not his but someone else's?
- A. It's still George's decision if he wants them or not. If he can give a good reason why he doesn't want them ...
- Q. Suppose he was told by SOC to take them on.
- A. I don't think George would be intimidated by SOC.
- (Transcript, vol. 94, pp. 172-76)

Although the latest forecast for the Dryden terminal available to the flight crew while they were in Thunder Bay forecast occasional light freezing rain, the forecast was not passed to the crew by SOC. There is no evidence to indicate whether the flight crew obtained the new Dryden forecast during the station stop in Thunder Bay. It is not known whether Captain Morwood considered the option of overflying Dryden; however, the option existed and would have been justified in light of the status of the aircraft, the fact that they were already behind schedule, and the forecast for freezing rain at Dryden.

The actual weather conditions on approach to Dryden were VFR. However, once the aircraft was on the ground in Dryden, the weather and the operational situation deteriorated. It should be noted that the crew was conducting a day of flying that must be considered stressful because of the mechanical problems with C-FONF, increasing delays, the frustrations experienced at Thunder Bay, the poor weather conditions, and the flight crew's relative inexperience in F-28 operations. While the aircraft was on the ground in Dryden, the following issues faced the crew:

- refuelling with an engine running;
- passenger connections at Winnipeg;
- de-icing with an engine running;
- the need to import ground-start equipment if both engines were to be shut down;
- the inconvenience and cost of stranding passengers in Dryden;
- snowfall during the stop, causing both aircraft and runway contamination;
- the implications of contamination on the aircraft;
- the implications of contamination on the runway;

- variance among Fokker, Piedmont, and USAir manuals regarding correction charts for takeoff from contaminated runways;
- deteriorating visibility that may have prevented the takeoff;
- the delay caused by the arrival of the Cessna 150; and
- personal plans of the crew for the next day.

According to Dr Helmreich, one of the effects of psychological stress, including that imposed by time pressure, is an inability to process multiple sources of information as effectively as under more relaxed conditions. As outlined in the previous section, a strong case can be made for a finding that the crew, and especially Captain Morwood as pilot-in-command, was under considerable stress by the time the flight stopped for the second time in Dryden. There is the evidence of Captain Morwood's demonstrated frustration during his telephone calls at the Air Ontario counter at Dryden. The aircraft load sheet containing aircraft weight and balance data was normally left with the station attendant immediately prior to departure from the ramp. According to the evidence of Mr Cochrane, the flight crew did not pass this document to him. In fact, after the aircraft was closed up and the second engine started, "First Officer Mills held the weight and balance up in the window to indicate that he had it in his possession" (Transcript, vol. 53, p. 163).

In addition, there was the evidence of Ms Jill Brannan, a Dryden Flight Centre employee on duty at the time of the accident, and of Mr Christopher Pike, who was near Ms Brannan at the time, that after flight 1363 taxied away from the ramp, there were two radio transmissions from the aircraft to the Dryden Flight Centre. Their evidence was that, during the radio transmissions, the pilot "seemed upset," "mad," "impatient," and "pissed off" at the prospect of yet a further delay caused by the Cessna 150 (Transcript, vol. 20, pp. 174-75; vol. 28, p. 22). The mood of the flight crew, combined with the lack of Air Ontario operational support and safety-oriented operating policies, may have precluded a rigorous crew evaluation of the operational situation.

The decision to take off raises several critical questions. One is whether the crew was fully aware of the safety implications of the accumulating snow. As noted, Captain Morwood had a history of concern and awareness of icing risks. He had delayed the initial flight of the day for de-icing. Testimony by a representative of Transport Canada described an incident when Captain Morwood insisted on going back to the gate in a Convair 580 for de-icing even though the Transport Canada inspector had remarked that the snow seemed dry and the propellers were blowing it off the wings. Also, a 1983 letter from Air

Ontario management endorsing a captain's authority to de-ice when circumstances require was found in Captain Morwood's flight bag at the accident scene.

Perhaps the most revealing incident of Captain Morwood's normally cautious attitude is an experience cited in evidence by a former first officer previously paired with Captain Morwood on the F-28, Captain Keith Fox. Captain Fox stated that while their aircraft was being de-iced in Toronto on February 26, 1989, both generators flickered on and off after engine start. He said it appeared obvious to them that the engines had ingested some de-icing spray:

- A. We shut the ... engines down and George, Captain Morwood said, well, it's probably something minor but, you know, we do not have bags of time on this aircraft. Let's get it checked out.
(Transcript, vol. 51, p. 85)

This evidence reflects Captain Morwood's normally conservative approach, and it also serves to indicate that there was a concern for the possible consequences of ingestion of de-icing fluid should de-icing take place with an engine running.

A second question is whether the flight crew was aware of the accumulation of snow on the wings at Dryden. The captain walked across the ramp to the terminal and back in his shirtsleeves during the stop and would have been aware of snow falling. During a telephone conversation with Ms Mary Ward at SOC in London during the stop, he commented to her that the weather at Dryden was "going down." At 12 noon, First Officer Mills advised Kenora Flight Service Station to the following effect: "We're down to about a mile and a half in Dryden in snow right now, quite puffy, snow, looks like it's going to be a heavy one" (Exhibit 7A, p. 29).

The flight crew also had the ability to observe the outer portion of the wings from the cockpit, and the testimony of informed passengers indicated that snow was accumulating there. The fact that Captain Morwood inquired of the station manager at Dryden about de-icing suggests an awareness of the problem. It is, in my view, inconceivable that the flight crew would have been unaware of snow on the wings.

It seems most likely that Captain Morwood weighed costs and benefits surrounding the issues referred to above and concluded that the best course of action would be to leave Dryden as soon as possible. Several factors may have influenced this decision. The multiple stressors involved in the situation, along with Captain Morwood's focus on completing the trip, may have caused him to concentrate on the benefits rather than the risks of taking off. The ambiguity of the Air Ontario procedures for de-icing with an engine running, combined with his

earlier experience with Captain Fox in Toronto, could also have influenced his decision not to de-ice the aircraft in Dryden.

The role of First Officer Mills in Captain Morwood's decision-making process could not be determined. However, based on considerations of Captain Morwood's history, it is not likely that he would have heavily involved First Officer Mills in the decision-making process.

It is probable that, with wet snow falling, the flight crew did not consider the effects of the phenomenon of cold soaking. Air Ontario pilots who gave evidence during the hearings demonstrated that they were not fully aware of the concept or the implications of cold soaking, particularly as it related to weather conditions such as existed in Dryden on March 10. The Piedmont F-28 Operations Manual, which was used by Air Ontario pilots, addresses the cold-soaking phenomenon in its Cold Weather Operations section. It states as follows:

When the tanks contain sufficient fuel of sub zero temperatures as may be the case after long flights at very low ambient temperature, water condensation or rain will freeze on the wing upper surfaces during the ground stop forming a smooth, hardly visible ice coating.

During takeoff this ice may break away and at the moment of rotation enter the engine causing compressor stall and/or engine damage.

(Exhibit 307, Piedmont F-28 Manual, 3A-24-1)

The caution relates to potential engine damage on takeoff rather than to the aerodynamic consequences of electing to take off with ice on the wing. Notwithstanding, the above information, combined with the other cautionary notes listed in the Piedmont and USAir manuals and the Fokker F-28 Flight Handbook, should have served to alert the flight crew of the need to inspect the wings prior to takeoff.

Given the large fluffy flakes coming down and the lack of accumulation on the tarmac surrounding the aircraft, the decision may well have been reached by the crew that the snow was melting and, therefore, would not adhere to the wing during the takeoff roll. The possibility that rough granular ice was developing under the snow on the upper surfaces of the wings because of the cold soaking was not likely considered by either Captain Morwood or First Officer Mills.

Once the aircraft was on the ground in Dryden, the implications of a long delay probably had an influence on the captain's decision to take off. Captain Morwood was clearly concerned about holiday passengers who were anxious to make connecting flights in Winnipeg, and both he and First Officer Mills had personal plans for the next day. Had the flight been cancelled in Dryden, it would have been necessary to fly in ground-start equipment, causing a lengthy delay and disruption of crew and passenger plans.

A last chance to re-evaluate the situation was probably missed when the flight took its final delay for the landing of the Cessna 150. It should be noted that a radio transmission from First Officer Mills to Kenora FSS in response to a request to hold for the Cessna 150 indicated that "we're down to about half a mile," referring to the visibility restriction caused by the snowfall. However, the accumulation of stress and frustration surrounding the day's operations had probably reduced the crew's effectiveness and decision-making capabilities by this time, as evidenced by the fact that the poor visibility did not affect the captain's decision to take off.

It is my considered opinion, after a thorough review of all the evidence, that the captain's decision to take off was made with the knowledge that snow was accumulating on the aircraft but with the mistaken perception and confidence that the snow was not adhering to the wings and would blow off during the takeoff roll. I do not believe that either Captain Morwood or First Officer Mills recognized the possibility that the cold-soaking effect could cause the wet snow to freeze to the upper surfaces of the wings; otherwise, based on his past performance, Captain Morwood would not have attempted to take off without first verifying his perception or having the aircraft de-iced.

Captain Morwood, as the pilot-in-command, must bear responsibility for the decision to land and to take off in Dryden on the day in question. However, it is equally clear that the air transportation system failed him by allowing him to be placed in a situation where he did not have all the necessary tools that should have supported him in making the proper decision.

Commercial and Operational Risk: Management Factors

Having examined the issues that most directly confronted the crew of flight 1363, I was particularly struck by certain evidence provided during the examination of Mr William Deluce, chief executive officer of Air Ontario Inc. The evidence related to the apparent difference in operating policy between Air Canada and Air Ontario regarding the dispatch of an aircraft with an unserviceable APU into a station with no appropriate ground-start facilities. The evidence is as follows:

- Q. Air Canada when it takes a jet like a 727 will not bring it into a place like Fredericton because there are no ground-start facilities in Fredericton, okay, that is a given.

Bill Deluce and Air Ontario acquire a new fleet of jets and they require APUs. My question to you, sir, is: Would Air

Ontario take your jet fleet that you could acquire tomorrow or next week and fly your jets into a place like Fredericton when there are no ground-start facilities available in Fredericton?

- A. Again, under those circumstances, we would make an assessment because ... the fact that you have or do not have an APU affects at the end of the day the reliability of that service, and ... I can only reiterate that there is nothing unsafe about flying into a place with no APU.

Air Canada – and can't speak for Air Canada ... may have a policy like that I don't know why they have their policies the way they are. I can tell you that each company has – looks at ways – the commercial – we will call it the commercial risk differently and different companies may come to different conclusions about what level of commercial risk they are prepared to take.

(Transcript, vol. 154, pp. 175–76)

Mr Deluce's evidence, when considered in isolation, appears quite innocuous. Certainly, different companies accept different levels of commercial risk as they see fit. There is nothing wrong with that; there is no flight safety consequence to the commercial risk that an airline is prepared to assume, provided that the commercial risk is not somehow translated into operational risk.

I interpret Mr Deluce to be saying in the cited quotation that Air Ontario was prepared to accept the commercial risk of grounding an aircraft at an outlying base that has no ground-start facility. Such commercial risk would include a consideration of:

- the inconvenience to stranded and downstream passengers, and resulting loss of goodwill;
- the cost of accommodating the stranded passengers; and
- the cost of replacement aircraft and crew.

Air Canada, apparently, is not prepared to accept such risk.

Mr Deluce also testified "there is nothing unsafe about flying into a place with no APU." Indeed, this is true if the operational personnel in a company clearly understand that the company is willing to accept the commercial risk of grounding an aircraft. I am of the view that, in such circumstances, the acceptance of commercial risk has no flight safety implication only if a documented operational policy exists reflecting the fact that conservatism and safety must prevail, and that such policy is clearly understood by flight crews, operational managers, dispatchers, and maintenance personnel.

If the prevalent operational management attitude in an airline was one where personnel are encouraged, either implicitly or explicitly, to push the limits of what is legal and sound operational practice, then the

commercial risk spoken of by Mr Deluce may be translated into operational risk. This is clearly not acceptable. For instance, when a pilot faced with the Dryden scenario clearly understands from published company policy that the company is willing to accept in such circumstances aircraft groundings or extended delays, then Mr Deluce may be right in saying that there is no flight safety implication to his company's policy regarding commercial risk.

In order to make an assessment as to whether Air Ontario was in fact willing to incur such delays and disruptions of schedules, with associated costs, it was necessary to review evidence that was indicative of the operational attitude of its management.

The following facts are representative of the Air Ontario operational management attitude in the months leading up to the accident on March 10.

- In an undated status report written by Captain Joseph Deluce, the F-28 project manager, in late June or July 1988, he pointed to reliability as the single most important problem with the F-28 program at that early stage. Inexperienced flight crews, low levels of expertise among maintenance personnel, and insufficient spares availability were identified as the causes of the reliability problems. To overcome the problems of inexperience and lack of expertise, Captain Deluce suggested in his report that aircraft utilization be significantly increased. Captain Deluce also suggested that if they did not fly the F-28 more, then their profit projections would not be realized.

I find the suggestions of Captain Deluce to be very troublesome. In the normal course one would expect, and rely upon, operational management to advocate conservative operational practice in the face of production pressures coming from the financial side of the organization. Instead, the opposite was true, and I find that was a significant problem in the management of the F-28 program. In fact, in this case, the more conservative judgement of Mr Thomas Syme, who had no operational experience, carried the day and the more restrictive F-28 utilization continued.

- It was demonstrated throughout chapter 25 of this Report, Management Performance, that when Captain Joseph Deluce was unchecked in his supervision of the F-28 program, pilots were left to determine their own standards and operational practices; often prudence and conservatism were lost in the pilots' collective enthusiasm to see their first jet operation succeed.
- F-28 pilots, including the chief pilot, Joseph Deluce, passed along reports of aircraft defects on pieces of paper in order to avoid grounding the aircraft (apparent violation of ANO Series VIII, No. 2).

- Captain Christian Maybury, when questioned about the practice of passing such messages on pieces of paper, testified: "As pilots, we wanted this operation to be successful. And I think that's what influenced our thinking in a lot of ways and why we tolerated a lot of this stuff for as long as we did" (Transcript, vol. 92, p. 115).
- For a period of six months after F-28 service was introduced, maintenance of essential aircraft equipment was deferred, though there was no approved MEL against which deferrals could be made (apparent violation of ANO Series II, No. 20).
- When asked about his own maintenance deferral practices, the director of flight operations, Captain Robert Nyman, testified that they were against "the legal letter of the law."
- On April 5, 1989, Captain Perkins operated the F-28 aircraft on a revenue flight from Winnipeg to Toronto without a serviceable master warning light, an item that he agreed, in evidence before this Inquiry, was an essential airworthiness item. The item was improperly deferred in the aircraft journey log. In a memorandum to Mr James Morrison, then Air Ontario's vice-president of flight operations, Captain Joseph Deluce defended Captain Perkins's decision on the basis that Captain Perkins was "comfortable with the warnings that were available" and "comfortable with Maintenance's decision to defer this item." Captain Deluce then stated that "with hindsight and questions being asked," he questioned whether the item should have been deferred and that he would attempt to get a better interpretation from Transport Canada on "what and how items can be deferred and when they can not" (Exhibit 337). The incident was but another indication of a tendency to keep the operation on schedule and sort out the details later.
- Captain Alfred Reichenbacher and First Officer Monty Allan, surprised one day at the general state of unserviceability of their F-28 aircraft, recorded a large number of snags in the aircraft journey log, effectively grounding the aircraft until they could be rectified. For this they were taken to task and threatened with suspension by the chief pilot.

If the actions and attitudes of the Air Ontario F-28 chief pilot and of the vice-president of flight operations are an indication of the standards of operation that were permitted, if not encouraged, then it is apparent how Mr William Deluce's commercial risk of a grounded aircraft in a Dryden scenario could turn into an operational risk of an attempted takeoff. A pilot would want to avoid the grounding of an aircraft because there is a possibility that he would have to answer to the company for having put the aircraft in the position of being grounded.

Given this state of mind, in a "bending the letter of the law" operational environment, where less restrictive operational practices are preferred, a pilot may be encouraged to encroach upon the margin of safety and attempt a takeoff with contaminated wings.

Flight Safety: The Air Ontario Corporate Business Plan

From a corporate perspective, the 1988 Air Ontario Inc. business plan (Exhibit 936) contained a mission statement that referred in part to "the creation of a safe and reliable diversified regional airline system." Yet, I could find no evidence of a company safety policy that, at the corporate level, reflected an overriding commitment to safety other than the above-noted general statement. Since the statement was contained in the company's business plan, it is unlikely that it received company-wide distribution.

The position of flight safety officer within the company appeared to have an "on again-off again" history. The original flight safety officer, Captain Ronald Stewart, resigned in 1987 after two years in the position, largely because of a lack of management support. Captain James Byers turned the position down because of a lack of a documented job description. Captain Stewart accepted the position for the second time approximately six weeks before the March 10, 1989, Dryden accident. A review of Air Ontario's investigation into three Air Ontario incidents, all involving Captain Joseph Deluce and two of which were takeoffs with a contaminated aircraft requiring an immediate return to the airport, have convinced me that whatever flight safety organization might have existed had little if any management support and was largely ineffective.

It is clear from the evidence that flight safety management within Air Ontario was left to operational managers and their appointees. From a corporate perspective, the commitment to safety management was, in the years preceding the Dryden accident, largely cosmetic. In light of the corporate and operational management attitudes discussed in this chapter of the Report, combined with the lack of an effective regulatory safety net, I can readily understand how commercial risk would become operational risk.

Safety Management

In light of the preceding discussion regarding the cause-and-effect relationship between commercial risk and operational risk, I refer to the writings of Dr C.O. Miller. In a paper entitled "Investigating the Management Factors in an Airline Accident" presented in 1990 to the

Brazilian Congress of Flight Safety (Exhibit 1251), Dr Miller made some observations that are, in my view, highly relevant. In the interests of brevity, key points are summarized as follows:

- There is a general lack of understanding of what constitutes safety/accident-prevention management throughout many parts of the aviation community.
- Airline and other management must become more attentive to accident prevention management for reasons of potential liability personally, let alone corporate liability in the event of an accident.
- Airline executives should make a corporate commitment to vigorous, viable, and visible proactive flight safety programs.
- Investigation of accidents in civil aviation does not have a procedure or protocol that will encourage examination of management failures in a causal sense. As a result, the management system leading to the failure often goes unchallenged. In that regard, International Civil Aviation Organization Annex 13 has yet to address management failures. I would observe that the most recent Transportation Safety Board accident investigation manual addresses the issue, but in a peripheral rather than a comprehensive manner. Nor is there any requirement in Canadian aviation regulations for a Canadian air carrier to have in place a comprehensive safety management plan.
- Safety policy that simply says "safety is our total priority," but is unsupported by a meaningful safety plan, is unacceptable.

On January 30, 1989, the International Air Transport Association issued a policy item to its member air carriers entitled "Airline Safety Manager." The policy states:

1. All airlines should establish a professional Safety Manager.
2. All airlines should support the following Flight Safety functions:
 - a. Organisation of Accident Prevention Programmes
 - b. Collection/Analysis/Communication of Safety Information
 - c. Technical and Safety Coordination
 - d. Corporate Emergency Response Procedures

The reason stated for adoption of the policy is quoted as follows:

Governments charge the airlines with the responsibility of satisfying the public need for safety and reliable air transport. This responsibility cannot be discharged without provision of adequate professional review of all safety related activities of each airline. To do this

effectively and efficiently, it is imperative that a professional Flight Safety Management post be established and adequate safety management functions supported.

(IHTA Technical Policy – Flight Safety Management)

I find the observations summarized by Dr Miller as well as the essence of the IATA policy document most appropriate to the evidence before me as they relate to the management aspects of this accident. I would go further and observe that they are not only relevant to air carrier management, but also to the management of regulatory bodies responsible for aviation safety.

Findings

- All of the air crew of Air Ontario flight 1363 on March 10, 1989, were certified and qualified for the flight in accordance with existing regulations.
- There was no evidence found that physical or psychological factors affected the air crew's performance.
- The facts derived from the Inquiry into the crash of Air Ontario flight 1363 are indicative of an operational environment that allowed an experienced captain to reach a flawed decision regarding the safety of takeoff during a heavy snowfall with accumulating contamination on the aircraft's wings.
- Neither Transport Canada in general nor Air Ontario in particular provided adequate information to pilots regarding the cold-soaking phenomenon and its effects on aircraft contamination after flight in conditions conducive to cold soaking.
- The preponderance of evidence indicates, and I find, that the fuel in the aircraft wing tanks of C-FONF was exposed to subzero temperatures in flight resulting in the manifestation of the cold-soaking phenomenon on the ground at Dryden.
- Captain Morwood was not sufficiently aware of or knowledgeable about the cold-soaking phenomenon to alert him to the possibility that fuel of subfreezing temperature in the aircraft wing fuel tanks could cause wet snow to freeze to the aircraft wings.

- The Air Ontario accident at Dryden, like similar aircraft wing contamination accidents, was preventable and should not have occurred.
- Had the required effective and adequate resources, regulations, procedures, training, and policies identified throughout this Inquiry been in place on March 10, 1989, it is possible, and indeed likely, that the event sequence that resulted in the accident would have been interrupted.
- A lack of understanding existed within the aviation industry in general and within Air Ontario in particular with respect to both safety and accident-prevention management, with a resultant lack of Air Ontario management attention and commitment to these important areas prior to the Dryden accident.
- The regulatory environment allowed decisions to be made that led to the lack of a complete safety net for the flight crew of flight 1363. I cite only two examples: the use of different aircraft operating manuals on the flight deck of the F-28, and the lack of a definitive regulation regarding aircraft contamination.
- The senior management of Air Ontario failed to ensure that commercial risk did not translate into operational risk. For example, C-FONF was allowed to land at Dryden in weather conditions that could have required that the aircraft be de-iced while the aircraft's APU was unserviceable and there was no F-28 ground-start equipment at Dryden.
- Air Ontario's efforts in the area of safety management in the critical months of the company's restructuring prior to the accident received little or no priority and can best be described as cosmetic.
- The Air Ontario policy that did not allow an F-28 aircraft to be de-iced while one of its main engines was running may have influenced Captain Morwood's decision not to de-ice the aircraft at Dryden. It is not known to what extent Captain Morwood was aware of this policy or what he thought of it.
- The weather conditions on March 10 were such that the flight crew of flight 1363 had to be concerned about the weather, but Air Ontario SOC personnel did nothing to assist the crew in operational decisions involving the weather, other than to delay the flight in Dryden on its first stop.

- The slush accumulation on the eastern end of the runway at Dryden contributed to a longer than usual takeoff roll by flight 1363.
- Air Ontario did not provide to its F-28 flight crews, nor did Transport Canada require, runway slush-correction charts that were readily usable in the aircraft cockpit.
- The aircraft C-FONF was not in a completely serviceable state, thereby putting additional pressure on the crew.
- The weather conditions on March 10, 1989, required that the flight crew of C-FONF use a more distant alternate airport, a situation that resulted in the crew's having to pay more attention to fuel and aircraft weight.
- Many of the events that occurred on March 10, 1989, served to increase the frustration levels of the crew members of flight 1363. Frustration can lead to hasty or ill-conceived decisions.
- In the investigation of accidents in civil aviation, there is no procedure or protocol that encourages examination of management failures relating to the cause of an aircraft accident. The most recent accident investigation manual of the Transportation Safety Board of Canada, while it addresses management failures peripherally, does not do so in a comprehensive manner.

RECOMMENDATIONS

The Human Performance chapter of this Report is, in many ways, a synthesis of all the issues that the crew faced on March 10, 1989, and recommendations on such issues have already been set out elsewhere. It is not my intent to repeat these recommendations in detail in this chapter, but, in the interests of continuity, a synopsis of the principal recommendations already addressed and relevant to Human Performance includes:

- A renewed air carrier certification and inspection program incorporating improved safety regulations, adequate resources, and properly qualified and trained personnel be implemented by Transport Canada on a priority basis.
- Formal training of all air carrier crew members in crew resource management be made mandatory by regulation.

- Crew-oriented training and evaluation be actively pursued jointly by Canadian air carriers and Transport Canada as a more effective means of training and evaluating air carrier flight crews.
- The appointment of an air carrier flight safety officer, approved by Transport Canada, and the establishment of an approved flight safety program by all Canadian air carriers be made a regulatory requirement.
- A systematic and comprehensive discussion regarding cold soaking, based on research such as was conducted for and on behalf of this Commission of Inquiry, be inserted in air carriers' flight operations manuals and/or aircraft operating manuals and in government publications such as the Aeronautical Information Publication in order to make all pilots and aviation operational personnel aware of the various factors that may cause contamination to adhere to lifting surfaces.

Recommendations not previously addressed and specific to this chapter are as follows:

- MCR 175** That the Transportation Safety Board of Canada further develop its human factors investigation procedures into human factors aspects of aviation accidents to include a comprehensive section addressing the role of air carrier management in the area of flight safety management; and that the board encourage examination of management failures in a causal sense as part of its accident investigation procedures.
- MCR 176** In conjunction with MCR 175 above, that the Transportation Safety Board of Canada actively pursue the amendment of appropriate International Civil Aviation Organization documents to address in a similar manner the role of air carrier management in the area of flight safety management.

PART EIGHT

LEGAL AND OTHER
ISSUES BEFORE THE
COMMISSION

41 THE AVIATION ACCIDENT INVESTIGATION PROCESS IN CANADA

As a result of the work undertaken by this Commission, several flaws were identified in the aviation accident investigation process in Canada.

In my first *Interim Report* of November 30, 1989, I pointed out that this Commission was born out of the public controversy surrounding the investigation by the Canadian Aviation Safety Board (CASB) of the Arrow Air DC-8 crash at Gander, Newfoundland, on December 15, 1985. Having recognized, early in the process, that an important objective of my Commission was to endeavour to re-establish public confidence in the accident investigation process in this country, I made the following commitment at the formal hearings of the Commission on June 16, 1989:

If during the course of this investigation fundamental flaws were found in this process, then appropriate recommendations will be made by me.

(*Interim Report*, p. 9)

This chapter of my report is written in response to that commitment.

At the outset it should be noted that the field phase of the Dryden crash investigation had already been completed by the CASB investigating team by the time that this Commission was constituted on March 29, 1989. Thus, I was not involved in the conduct of the initial phase of the investigation.

However, during the remainder of the investigation, conducted under the auspices of my Commission, I have had an opportunity to observe first hand the effectiveness of CASB's organizational structure, investigative methodology, and practices. I can state that I was generally favourably impressed with the calibre of individual CASB staff members who were seconded to this Commission to assist in the investigation of the Dryden crash. In particular, I must single out Mr Joseph Jackson, the investigator in charge, Mr David Rohrer, the chairman of the operations group, and Mr David Adams, the human factors expert working for CASB on secondment from the Bureau of Air Safety Investigation in Australia, all of whom were seconded on a full-time basis to my Commission from CASB. Each epitomizes consummate professionalism

in his work and each has made an invaluable contribution to this process.

A prerequisite for an evaluation of the Canadian aviation accident investigation process is a review of some of the basic principles laid down in the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act*, S.C. 1989, c.3. The Act established the multi-modal Canadian Transportation Accident Investigation and Safety Board (CTAISB), which replaced CASB, as the aviation accident investigating authority in Canada. Subsequently the federal identity program formally changed the short title to the Transportation Safety Board of Canada (TSB).

As a result of observations that I have made in the course of the proceedings of this Inquiry, the briefs and investigators' reports received, and consultations with Commission of Inquiry investigators, counsel, and technical advisers, I have concluded that the *CTAISB Act* contains several provisions, as did its predecessor *CASB Act*, which impair the investigative process and compromise the independence of the Canadian investigating authority. Of particular concern are the Act's provisions dealing with:

- the granting of observer status to interested parties;
- the privileged status of certain factual evidence, including witness statements, on-board recordings, and air traffic control communications;
- the requirement for the TSB's draft report to be reviewed by interested parties.

In addition, six other areas of concern have come to my attention on which I feel obliged to report:

- the training of investigators;
- the taping and transcription of interviews;
- the lack of use of outside experts by the investigating authority;
- the lack of forensic training for TSB scientists;
- the need for greater emphasis by the board of the TSB on human factors in aviation accidents;
- the monitoring of TSB recommendations.

I will now deal with each of these concerns affecting the investigative process and comment upon them. I have confined my comments and the recommendations which follow to the matter of aviation occurrences.

The Granting of Observer Status to Interested Parties

It should be pointed out that in the case of a major aviation occurrence, such as the Dryden crash, the investigation is conducted by a team of investigators led by the investigator in charge (IIC). Investigators are generally assigned to specific investigating groups within the team in accordance with their area of expertise and under the leadership of a group chairman.

A party having a direct interest in the investigation of an aviation occurrence in Canada has no legal right whatsoever to attend at that investigation, even as an observer, unless invited by the board to so attend under the provisions of section 23(2)(d) of the *CTAISB Act*. Section 23(2) reads as follows:

Subject to any conditions that the Board may impose, a person may attend as an observer at an investigation of a transportation occurrence conducted by the Board if the person

(a) is designated as an observer by the Minister of Transport in order to obtain timely information relevant to the responsibilities of that Minister;

(b) is designated as an observer by the Minister responsible for a department having a direct interest in the subject-matter of the investigation;

(c) has observer status or is an accredited representative or an adviser to an accredited representative, pursuant to an international agreement or convention relating to transportation to which Canada is a party; or

(d) is invited by the Board to attend as an observer because, in the opinion of the Board, the person has a direct interest in the subject-matter of the investigation and will contribute to achieving the Board's object.

Section 23(3) of the Act contains a provision for the removal of an observer from an investigation:

The Board may remove an observer from an investigation if the observer contravenes a condition imposed by the Board on the observer's presence or if, in the Board's opinion, the observer has a conflict of interest that impedes the conduct of the investigation.

The investigation of a major air carrier accident is a formidable task under the best of circumstances. Since such an accident is a manifestation of failure in a complex system that is designed to operate accident-free, it would be logical to assume that the system's designers are in a

good position to identify and correct the flaws that underlie the accident. This, however, would mean that the investigation of an air carrier accident would be left in the hands of manufacturers, air carriers, regulators, and others responsible for the system's daily functioning. Although such an investigation would benefit from the expertise available, it would probably lack objectivity when one of these parties inevitably assumed a dominant role. After all, each of these parties has at risk a reputation or a financial stake, or both, depending on the outcome of the investigation.

To avoid the possibility of relying on any of the interested parties involved, most countries have established independent aviation accident investigating authorities in accordance with International Civil Aviation Organization (ICAO) guidelines. Canada has done so with the creation of CTAISB in 1990 and its predecessor CASB in 1984. Given proper staffing, training, and procedures, these authorities develop specialized skills in investigation management. It should be pointed out, however, that, unless investigators within such organizations have an opportunity to keep abreast of technological advances, there is a drawback inherent in the investigating authority's relying only upon a permanent staff of investigators. While gaining the necessary investigative skills, aviation accident investigators, over time, may lose some of their currency in the field of expertise that brought them to the authority in the first place. Periodic refresher courses do not necessarily give assurance that the investigators are fully familiar with the aviation system's current technological advances, peculiarities, and pitfalls.

I make these observations to emphasize the need to keep abreast of new technologies in the industry. It is wise for the investigating authority to avail itself of the expertise within the aviation industry by seeking, on an ad hoc basis, the services of persons with special expertise from within the aviation industry on investigative teams controlled by government investigators, as was in fact done by this Commission.

Practical experience has shown that a coordinated investigative effort is best achieved by using the group system of investigation, as recommended and explained in the ICAO Manual of Aircraft Accident Investigation. In my view the functioning of the group system is enhanced by granting to appropriate representatives of the interested parties, who possess special expertise, status as participants in the accident investigation. It is on this point that I find the Act fundamentally flawed in that it does not guarantee status for interested parties.

The only status for qualified representatives of the interested parties on aviation accident investigation teams, recognized by section 23 of the Act, is that of observer-invitee. By definition, the observer role is a limited role, and its limitations are exacerbated by the Act's prohibition

against the exchange of certain information as explained in the discussion of witness statements that follows.

Inasmuch as this Commission of Inquiry derives from the provisions of the *Inquiries Act* and was not bound by either the provisions of the *CTAISB Act* or the predecessor *CASB Act* in the conduct of its investigation, and seeking to benefit from the best expertise available, I granted to interested parties, on an experimental basis, the right to second persons with particular expertise from among their ranks as full-fledged participants in specific investigation groups (see pages 10–14, 17, and appendix D of my first *Interim Report*). This experiment provided to the investigating teams expertise that was not otherwise available and proved to be highly successful.

It is my recommendation that the Act be amended to provide to interested parties the right to full participant status on CTAISB investigating team groups, by secondment to those groups of individuals from among the interested parties who, in the opinion of the board, possess expertise enabling them to contribute to the investigation.

I am indebted to the parties who made the expertise available, to the participants themselves, and to the CASB investigators seconded to my Commission, under whose leadership the technical investigation of the Dryden accident was successfully completed.

The Privileged Status of Certain Factual Evidence

Sections 28 and 29 of the Act, respectively, provide, inter alia, that on-board recordings made on the flight deck of an aircraft, and a communications record relating to air traffic control or related matters, are privileged. Section 30 of the Act provides that statements relating to a transportation occurrence and the identity of the author are privileged.

Sections 28(5), 29(5), and 30(4), respectively, provide that such on-board recordings, communications records, and statements shall be made available to the following persons only:

- (a) a peace officer authorized by law to gain access thereto;
- (b) a coroner who requests access thereto for the purpose of an investigation that the coroner is conducting; or
- (c) any person carrying out a coordinated investigation under section 18 or designated as an observer by the Minister of Transport under subsection 23(2).

It is obvious from a reading of these sections that even those persons invited by the board itself to attend as observers, pursuant to section

23(2)(d), are effectively excluded, by virtue of these provisions, from examining the material in question.

It will also be seen that there is no specific provision in these sections of the Act by which any of this material could be made available to individuals who would be granted, pursuant to my previous recommendation, participant status on investigation team groups, as representatives of parties who have a direct interest in an aviation occurrence.

The analysis of the evidence begins well before the fact-gathering phase of an aviation accident investigation is completed. There cannot be a meaningful fact-finding process unless the potential importance of each new piece of evidence is analysed and used to determine the scope and direction of the investigative effort. A theorizing process is essential to a thorough investigation since it leads to the exploration of every possible avenue in the search for all of the facts.

To ensure that the collective expertise of the investigation team is brought to bear on the development and testing of theories, incoming factual information should be freely shared with all team members, including experts seconded from the participating parties. Unencumbered by the provisions of the *CASB Act* (now the *CTAISB Act*), and, after due consideration, I decided to direct that all participants on specific investigating team groups operating under my Commission of Inquiry would share in all factual material from the investigation, in return for an undertaking of confidentiality. I can report that there was a very satisfactory result and a clear benefit, in terms of the additional expertise provided, from this decision. The truth is that certain provisions of the Act hamstringing the board in the application of this concept. In addition to permitting interested parties to participate at an investigation only as invited observers, sections 28, 29, and 30 of the Act list various items of evidentiary material, such as air traffic control tapes, cockpit voice recordings, and witness statements, that cannot be released to observers representing interested parties on the investigation team.

It is of interest to note that ICAO Aircraft Accident Investigation, Annex 13 to the Convention on International Civil Aviation (7th ed., May 1988), recognizes participants, not observers. Section 5.26 of ICAO Annex 13 recommends:

Participation in the investigation should confer entitlement to:

- (a) visit the scene of the accident;
- (b) examine the wreckage;
- (c) question witnesses;
- (d) have full access to all relevant evidence;
- (e) receive copies of all pertinent documents; and
- (f) make submissions in respect of the various elements of the investigation.

(Exhibit 430)

By legislating privileged status for witness and survivor statements, section 30 of the Act detracts from the effectiveness of the theorizing process, and raises two further possible problems:

- 1 Witnesses who are assured of the confidentiality of their statements and identities may be tempted to stretch their recollections to accommodate their preconceived notions or biases, as well as those of the investigator/interviewer, knowing that they will be unchallenged.
- 2 The withholding of such information from the individuals representing the parties as either observer or participants on investigating teams implies that the parties – and the public – have to accept the board's interpretation of that information on blind faith. The resultant appearance of lack of openness in the investigative process does not instil confidence in its outcome.

With regard to section 29, I fail to see the justification for giving air traffic control transcripts privileged status when any person on the same frequency had access to the transmissions involved. I firmly believe that, under properly controlled conditions, the sharing of pertinent portions of the cockpit voice recorder and flight data recorder information with the parties will contribute greatly to the timely and effective completion of the investigative process.

I recommend that the provisions of sections 28, 29, and 30 be amended to provide that statements and the other material referred to shall be made available on a confidential basis to individuals granted full participant status as representatives of parties having a direct interest in the accident investigation.

In order to avoid any misunderstanding, I re-emphasize that I fully endorse the confidentiality of statements made under the provisions of the board's confidential aviation safety reporting system. The subject of privilege with respect to pilot incident reports made on a confidential basis in connection with an air carrier's flight safety and accident prevention program is dealt with in detail in chapter 42 of this Report, Incident and Accident Reporting and Pilot Confidentiality.

Review of the Board's Draft Report

The stated object of the Transportation Safety Board is to advance transportation safety. Section 7(1) of the *CTAISB Act* lists five means by which this objective is to be achieved. That section reads as follows:

The object of the Board is to advance transportation safety

- (a) by conducting independent investigations and, if necessary, public inquiries into transportation occurrences in order to make findings as to their causes and contributing factors;
- (b) by reporting publicly on its investigations and public inquiries and on the findings in relation thereto;
- (c) by identifying safety deficiencies as evidenced by transportation occurrences;
- (d) by making recommendations designed to eliminate or reduce any such safety deficiencies; and
- (e) by initiating and conducting special studies and special investigations on matters pertaining to safety in transportation.

Section 7(1)(a) charges the board to conduct “*independent investigations and, if necessary, public inquiries into transportation occurrences.*” The obvious objective is to assure the public that the investigating authority will not hesitate to identify safety deficiencies, regardless of which government agency, corporate entity, or private individual played a role in the accident sequence.

With this objective in mind, the authority’s formulation of its findings, conclusions, and recommendations for its final report is critical. It is essential for the authority to avoid even the appearance of influence from organizations or persons with a vested interest in the outcome of the authority’s deliberations. Unfortunately, there is a provision in the Act that may well give the public reason to question the board’s independence. Section 24(2) of the Act requires that the board, before making public an occurrence report, circulate its draft report to parties and ministers deemed by the board to have a direct interest in the board’s findings and to permit representations with respect thereto:

Before making public a report under subsection (1), the Board shall, on a confidential basis, send a copy of the draft report on its findings and any safety deficiencies that it has identified to each Minister and any other persons who, in the opinion of the Board, has a direct interest in the findings of the Board, and shall give that Minister or other person a reasonable opportunity to make representations to the Board with respect to the draft report before the final report is prepared.

Requiring the board to submit its draft report to interested parties, be they ministers or other persons having a direct interest in the board’s findings, so they can make representations to the board, strikes me as being somewhat analogous to requiring a judge, after hearing the evidence at trial, to submit his or her draft judgement for review and comment by the litigants, before it is formally entered into the record. The board’s conclusions, like the judgement of a court, should not be

subject to what on the face of it is a process which can only be described as demeaning to the integrity and independence of the board.

The public, including persons in the industry, has the full right to expect the board to reach its conclusions from the evidence before it, independently and free from outside influence. Section 4 of the Act requires that board members be knowledgeable in transportation matters. The chairman of the board has the responsibility to maintain a staff with the professional qualifications needed to conduct investigations that fully satisfy the public's and the industry's safety concerns. If properly followed, these requirements should bolster the public's trust in the board's integrity and competence. There is simply no logic to undermining this trust by legislation which gives the appearance that the board is to seek an imprimatur from interested parties for its final report.

The provision in the Act that charges the board to solicit representations on its draft report from interested parties probably finds its rationale in the desire to avoid shortcomings in the final report. However, this provision hardly represents a vote of confidence by the Government of Canada in the board it has created. The damage that this review by interested parties does to the credibility of the board and its reports is in my view too high a price to pay. If interested parties were granted full participant status with the right to assign experts to be full-fledged participants in the investigative process, as I have recommended, rather than being observers as is the case at present, their views on the facts would be made known at the investigative stage. This would then avoid the unseemly practice legislated by section 24(2) of the Act of inviting representations by the interested parties on the contents of a draft report formulated by the board after its review of the evidence.

Section 24(2) of the Act, which entitles interested parties to review and make representations regarding the board's draft report, should be replaced with a provision that gives to participants the right to make their own submissions to the board following completion of the investigation and prior to the preparation by the board of its final report. The logical time for those interested parties who have been granted participant status to exercise this privilege would be at the completion of the fact-gathering phase of the investigation or upon completion of a public inquiry conducted by the board. The changes to the Act that I advocate here would render superfluous the review by participating parties of the board's draft report. In such a case, the board, after completing its investigation, need only concern itself with the production of a final report in respect to a transportation occurrence.

Sections 26(1) and (2) of the Act empower the board to reconsider its findings and recommendations when, in its opinion, new evidence becomes available. Lacking in this section is a specific provision entitling

a party with a direct interest in an investigation or public inquiry to petition the board for reconsideration of its conclusions where it is shown that new and material evidence has been discovered that might reasonably affect such conclusions or where the board's factual conclusions are shown to be erroneous. I am of the view that the incorporation of such a provision in section 26 of the Act, together with my recommendation for giving parties the right to make formal submissions prior to the board's drafting of its final report, should ameliorate any concern by the interested parties over the loss of their present right to review and make representations with regard to the board's draft report.

The Training of Investigators

During the course of this Inquiry, I and my staff have read and reviewed the records of hundreds of witness interviews conducted by investigators on behalf of CASB, and later on behalf of this Commission. As is the case with every investigation, witness interviews provided the basis for virtually all of the Commission's investigative activity. There were large variances in the ability of individual CASB investigators to conduct witness interviews, as is evidenced by the interview transcripts and records. Many initial interviews were in fact well conducted. Numerous others, because of the investigator's lack of forethought and interviewing skill, did little to enhance the investigative process. As a result, numerous witnesses had to be re-interviewed by Commission staff.

In order to provide the direction required in the investigative process, an interview must be conducted in a manner that will, it is hoped, extract from each witness his or her best recollection of the events observed by that witness. To accomplish this task is by no means easy. The interviewer must be trained and well prepared for the interview, there must be a purpose to every question, and every answer must be immediately analysed to determine if follow-up questions are required.

A number of the interview records clearly demonstrated that some of the CASB investigators were not well trained or well prepared to conduct interviews. Interviewing of potential witnesses is a skill which is gained by practical training and experience. An interview is not conducted for the purpose of projecting the views and opinions of the interviewer to the witness, as indeed occurred in some of the initial interviews done under the auspices of CASB. It is of utmost importance to an ongoing investigation that witness interviews conducted shortly after an air carrier accident be carried out in the most professional

manner possible. One of my most vivid impressions from the investigative stage of the Inquiry is that there is a dire need for investigators trained in witness-interviewing techniques.

My concerns relating to the witness-interviewing skills of some of the accident investigators seconded to this Commission by CASB were made known to Mr Joseph Jackson, the investigator in charge, and to CASB, in the summer of 1989, while the Dryden accident investigation under the auspices of this Commission was still ongoing. It had been my intention in this Report to make a recommendation that the CTAISB should develop a mandatory training program whereby all its investigators undertake and complete initial and recurrent professional training in witness-interview techniques and report writing, as well as accident investigation generally, such training to be provided through recognized professional learning institutions specializing in the training of accident investigators or a senior police force. However, during the month of May 1991, it came to my attention that, following my expressions of concern and, commencing in the autumn of 1989, the TSB began discussions with professional consultants and in October 1989 contracted with the Public Service Commission's Training Programs Branch to develop a witness-interview training course structured specifically for TSB investigators. I have been advised that, as of March 1991, 77 TSB investigators have participated in newly developed courses in witness-interviewing techniques. I am further advised that such training is now mandatory. It has also been brought to my attention that TSB investigators will receive recurrent interviewing-technique training on a regular basis and that investigators are being encouraged to request additional training if they feel it will enhance their interviewing skills.

I am encouraged by the fact that the TSB has initiated what I consider to be an essential training program in response to the concerns identified by this Commission of Inquiry. I would commend the TSB for so doing and I am hopeful that the training program undertaken will improve the quality of aviation accident investigation. Only the passage of time will reveal whether the quality of this training program is sufficient to meet the challenge presented.

The Taping and Transcription of Interviews

While conducting pre-hearing interviews with knowledgeable persons and potential witnesses, my Commission staff, with the exception of a few occasions early in the process, endeavoured to record the witness interviews on tape. This was done not only to ensure accuracy, but also to expedite the interview process by ensuring an orderly flow of

questions and answers and to achieve a timely process by not having to write down everything that was spoken. Persons interviewed were, without exception, offered a transcription of their interview once completed, as well as access to the interview tape.

The Canadian Air Line Pilots Association (CALPA) initially objected to the recording of witness interviews and insisted that many of the interviews of pilots who were CALPA members not be taped. In such cases all questions posed by counsel and the answers given by CALPA members had to be transcribed by hand, a time-consuming process to say the least. In addition to increasing the work of Commission staff, this process did not add to the assurance of accuracy of the interview record.

Being fully aware of the frustrations experienced by my investigators and counsel who helped interview hundreds of witnesses during this Inquiry, I am of the firm view that all interviews conducted in connection with an air carrier accident should be tape recorded and transcribed, and I would recommend an amendment to the Act to so require. Such a procedure would not only be in the interest of the investigating agency, but also would protect those being interviewed. There is, in my view, no rational basis upon which a person being interviewed in connection with an air carrier accident investigation should be able to insist on handwritten notes of the interview being made, in place of accurate electronic tape recording.

The Use of Outside Experts

The success of an investigation depends on the logical and methodical gathering of all pertinent evidence. The quality of the evidence so assembled will, to some extent, reflect the skill and knowledge of the persons gathering and assimilating the evidence. The value of such evidence will largely depend upon the skill and ability of those analysing and interpreting it.

This Commission of Inquiry, in addition to utilizing CASB staff experts, relied extensively upon independent experts. Experts in aircraft ground de-icing, engines, aircraft performance, aerodynamics, meteorology, human factors and human performance, and aeronautical engineering were retained to assist with the investigation and in some instances to testify before the Commission. Such experts were retained partly because there was a lack of particular expertise within CASB, from which the majority of the Commission's investigators came, and partly because, as I stated in my first *Interim Report*, "I considered it important for my Commission to have the benefit of totally independent expert advice" (p. 6).

Having observed many witnesses testify before the Commission on complex technical matters, I am of the opinion that the TSB, the agency responsible for the investigation of aircraft accidents in Canada, would benefit from the assistance, on an ad hoc basis, of highly qualified professional experts from outside its ranks. It would be unrealistic to expect the TSB to maintain on staff all manner of expertise required in the investigation of an aircraft accident. Accordingly, I recommend that an expert witness roster be developed by the TSB, in consultation with the aviation industry, consisting of persons willing to be called upon to assist in any given investigation, upon very short notice. I would strongly recommend that the TSB establish close liaison with the National Aeronautical Establishment and the National Research Council Canada and utilize fully their facilities and staff experts in various disciplines, as this Commission has in fact done. Such lists of experts, when established, should be updated from time to time to reflect the highest degree of knowledge and expertise available. As a direct result of my experience on this Commission, I am of the firm belief that the utilization by the TSB of its own in-house experts as well as outside experts from such a list on an ad hoc basis is both a desirable and a practical way to enhance the quality of aircraft accident investigation in Canada.

Forensic Training for TSB Scientists

The TSB (previously CASB) employs a number of forensic scientists. The word forensic means “of or in relation to courts of law.” Forensic scientists must, by definition, possess expertise beyond their scientific field in that they must be able to attend at a court, inquiry, or inquest and properly present their evidence with clarity. They must be able to explain, support, and extemporaneously defend their conclusions in the crucible of the witness box. To do so requires special training.

During the hearings of this Commission of Inquiry, I formed the impression that some CASB scientists who appeared as witnesses, although obviously experts in their respective scientific fields, were, through no fault of their own, ill-equipped to present their evidence adequately in a public forum. Some of the shortcomings I observed in the presentation of evidence by some of the TSB forensic scientific witnesses included:

- venturing an opinion clearly outside the area of expertise
- CASB did not understand fully the significance of protecting the continuity of an important piece of evidentiary material

- CASB did not appreciate the importance of requiring the designated CASB engine expert to attend personally at the initial post-crash disassembly by the manufacturer of the aircraft engines
- the attachment as an appendix to a scientist's report of a report from a manufacturer, when such report was not clearly understood
- obvious discomfort or unease on the witness stand, particularly during cross-examination.

These observations led me to direct inquiries to be made of Mr Doug Lucas, director of the highly regarded Centre of Forensic Sciences in Toronto. Mr Lucas has indicated that, when interviewing potential candidates for the position of forensic scientist at the centre, focus is exclusively on whether the scientist can cope with the demands of the witness box. Academic qualifications are taken as a given. Only one in ten otherwise qualified scientists meets this criterion. Thereafter, the successful candidate embarks on a two-year training program. At the end of the first year, the scientist's continued employment is contingent upon the successful handling of a mock court exercise where the candidate is the witness. Only rarely are candidates allowed to testify in court prior to completing the two-year training program. They are never allowed to testify prior to the completion of one year's training.

The training syllabus followed by the Centre of Forensic Sciences includes having candidates observe the testimony of others to familiarize them with different styles of examination and cross-examination. Mock exercises are videotaped and reviewed as a training tool. The candidate must complete a course of reading covering such topics as the rules of evidence, the structure of various tribunals and the functions of the associated officials, preserving continuity, note-taking, and the pitfalls associated with being an expert witness. All of this is in addition to continuing scientific training within the candidate's area of specialty.

By contrast, I have been informed that CASB scientists received a half-day lecture from CASB counsel devoted primarily to explaining the provisions of the *CASB Act*. It is therefore not surprising that some of the CASB scientists who testified encountered difficulty on the witness stand.

In order to advance the image of the TSB as a world-class investigative body, I am convinced it is essential that forensic training be provided to TSB scientists and that the TSB call upon such outside resources as are necessary to assist them in this endeavour.

Human Factors in the Investigation of Aviation Occurrences

From the beginning of the work of this Commission, I resolved that, if human error was a basic cause of the Dryden crash, as indeed has turned out to be the case, it would not be acceptable simply to identify pilot error as a cause without a thorough investigation of all factors which may have influenced the actions of the pilots. Although it was not difficult to identify pilot error as one of the factors in the Dryden crash, it was by no means the only factor, as can be seen from the body of this Report.

It is internationally recognized that human performance issues are major contributing factors in approximately 80 per cent of all aircraft occurrences. The ICAO clearly views human factors as a legitimate investigative pursuit. In its *Manual of Aircraft Accident Investigation* (4th ed.), ICAO postulates the following basic criteria for aircraft accident investigation:

Reduced to simple terms, the investigator has to determine what happened, how it happened, and why it happened, applying these questions not only to basic cause but to all aspects relating to safety

...

... Similarly, if human error appears as a possible cause of the accident all factors which may have influenced the actions should be examined ... Experience has shown that the majority of aircraft accidents have been caused or compounded by human error, often by circumstances which were conducive to human error; this applies to design, manufacture, testing, maintenance, inspection and operational procedures both ground and air. Identification of this element is frequently difficult but it may be revealed by careful, skilful and persistent investigative methods.

Some aircraft accidents have resulted from organizational defects or weaknesses in management; for example, an operator may have prescribed or condoned procedures not commensurate with safe operating conditions in practice. Similarly, ambiguous instructions, and those capable of dual interpretation may also have existed; these factors may well have stemmed in the first instance from uncritical scrutiny by regulating authorities. It may therefore be necessary to inquire closely into other organizations or agencies not immediately or directly concerned with the circumstances of the accident but where action, or lack of it, may have permitted or even caused the accident to happen.

(Exhibit 429)

This broad approach to the search for all possible factors which may have influenced an aircraft accident, advocated by ICAO, represents the investigative methodology adopted by this Commission of Inquiry. In my view this is the only acceptable way to conduct a full and proper investigation of an aviation occurrence. The subject of human factors or human performance in the context of aviation accidents was canvassed in depth during the hearings of this Commission and is covered at length in Part Seven of this Report, *Human Factors*.

The 1981 Report of the Commission of Inquiry into Aviation Safety, which recommended the establishment of the Canadian Aviation Safety Board (CASB, now the TSB), also suggested that the Canadian investigative authorities should improve human performance investigations.

Although the TSB now has a human factors unit and a number of human factors specialist researchers and investigators, it would appear that the board has not yet fully perceived human factors as a legitimate pursuit. This conclusion is reached in part on the basis of an analysis of board decisions which indicate an approach predicated on the view that, if something cannot be quantified as a fact, then it is not used in statements of cause. This approach certainly does not work for human factors considerations. Any reticence to draw inferences, or conclusions, on the basis of a preponderance of evidence is in my opinion detrimental to the conduct of a full investigation of an aviation occurrence and is totally counterproductive to an investigation of human factors issues. I am strongly of the view that the board should adopt a policy recognizing that the investigation of human factors is a legitimate pursuit in the investigation of and reporting on an aviation occurrence.

The Monitoring of TSB Recommendations: One Example

The proceedings before me revealed that, from time to time, the TSB, and its predecessor, CASB, have made recommendations for consideration and action in the interest of aviation safety to the minister of transport. The evidence before me further revealed that on some fundamental safety issues an inordinate amount of time passes between the date of a TSB (or CASB) safety recommendation and consequent action by the minister. This unsatisfactory state of affairs can be illustrated by describing what has occurred, and is continuing to occur, in relation to the issue of carry-on baggage.

Civil Aviation Inspector Randy Pitcher, in his testimony before the Commission, described the problem of carry-on baggage in the following terms:

- A. I appreciate the fact that it doesn't appear that the carry-on baggage may have been a factor in the number of people that unfortunately lost their lives at Dryden, but I do understand that the overhead rack was, to some extent, limiting in terms of people being able to escape the aircraft.

But specifically, the problem that exists today primarily is a situation where you have passengers deplaning or changing from a large airplane, for example, a 767, off of Air Canada or Canadian, and joining an Air Ontario Dash 8, F-28, or indeed a Canadian ATR 42. They may have very, very bulky carry-on baggage, and it's been my experience, sir, that flight attendants are forced to deal with this difficult problem right on board the airplane. It creates unnecessary stress for the flight attendant. It certainly is not a pleasant situation for the passenger.

And my recommendation would be that flight attendants, first of all, should not have to deal with these problems on the airplane, that carriers must take measures to screen this kind of carry-on baggage, that overhead bins often times, although they are designed for hats and coats, often times passengers do load very, very heavy pieces of luggage which become projectiles, which become very dangerous in an accident situation.

(Transcript vol. 128, pp. 6-7)

The problem described by Mr Pitcher is not new. In fact, it was known to Transport Canada at least as far back as October 24, 1985, when Mr Donald Douglas, then director of Transport Canada's Licensing and Certification Branch, noted in a memorandum that the director general of air regulations "has been advised that Donna Richard will be taking on the carry-on baggage project" (Exhibit 1174).

By correspondence dated January 28, 1986, Mr William Tucker of CASB wrote to Mr William Slaughter, then director of Transport Canada's Aviation Safety Programs Branch, expressing concern about the amount of cabin baggage being brought aboard aircraft:

Three confidential aviation safety reports have been received from flight attendants employed by different airlines expressing concerns about the amount of cabin baggage being brought aboard aircraft.

(Exhibit 1175)

Mr Tucker noted in his correspondence that the carry-on baggage issue had been discussed with Air Canada, CP Air, Nordair, and PWA, and that there was common agreement that the issue could only be resolved on an industry-wide basis. Mr Tucker's letter described the safety concern in the following terms: "The resultant situation could lead to unnecessary injury and perhaps even obstruct evacuation routes in the event of a serious occurrence involving a large passenger aircraft."

The evidence indicates that Mr Slaughter transmitted these concerns to Mr Douglas, the Transport Canada officer responsible for air carrier passenger safety standards. On February 27, 1986, Mr Douglas communicated with Mr Slaughter, stating in part: "if consultation with the carriers does not prove beneficial, or at the completion of the survey it is evident there is no improvement, consideration will be given to developing more stringent legislation" (Exhibit 1176).

Ms V.M. Doll, the acting manager, passenger safety, made a note on her file, dated December 11, 1986, indicating that amendments to Air Navigation Order Series VII, No. 4, Carry-On Baggage Order, were prepared and that air carriers had been consulted. However, the fact is that no amendments to the ANO were passed to restrict carry-on baggage.

Almost four years later, on July 25, 1990, the TSB drew attention to a potentially serious aviation safety deficiency and released four safety recommendations, based on more than 60 incident reports, relating to the lack of clear guidelines concerning carry-on baggage. The TSB recommendations state in part:

It appears that this potentially serious aviation safety deficiency is the result of air carriers failing to comply with existing legislation, a lack of clear definition as to the size, weight and amount of carry-on baggage that is permitted, and a lack of understanding on the part of passengers of the safety implications of this issue.

(Exhibit 1179)

Pursuant to the *CTAISB Act*, the minister of transport had 90 days in which to reply to the recommendations. Accordingly, the ministerial response was, by law, required by October 25, 1990.

As of the date of writing this section of my Report (June 28, 1991), there have been at least five consecutive years of documented, legitimate expressions of concern by CASB or the TSB on the issue of carry-on baggage, with no meaningful action on the part of Transport Canada. Surely it is totally unacceptable that, within a five-year period, there has been no regulatory change enacted to eliminate a serious and legitimate aviation safety concern.

Despite repeated warnings and recommendations from CASB (and the TSB) to Transport Canada, the issue of carry-on baggage remains unresolved, largely, based on the evidence before this Inquiry, because of the lobbying of the Air Transportation Association of Canada (ATAC).

In my view, the TSB's responsibility for safety recommendations should extend beyond merely notifying the minister of transport of a safety concern. The TSB should have the responsibility under law for tracking and following up on the action taken by the minister of transport on a safety recommendation, and if no action is taken within

a specified time frame, it should have the authority to require an explanation from the minister. Any legislation conferring upon the TSB the power to follow up its safety recommendations should include a legislated mode of procedure which causes Transport Canada to commit itself to a resolution date rather than allowing the regulator simply to indicate that a matter is being studied or considered.

RECOMMENDATIONS

It is recommended:

MCR 177 That the *Canadian Transportation Accident Investigation and Safety Board Act* be amended and regulations be passed to provide that, at any major aircraft accident investigation, parties having a direct interest in the investigation have the right to nominate, in consultation with the investigator in charge, individuals with specific expertise from among their ranks to be involved in the investigation as participants (as opposed to observers) on specific investigation team groups, such as operations, human factors, records, systems, engines, or site survey.

The terms and conditions of such participant involvement should be determined by the Transportation Safety Board of Canada and ought to include provisions placing participants under the authority of and responsible to the investigator in charge, as well as provisions to ensure the absolute confidentiality of all information and documentation gathered relating to the investigation.

MCR 178 That sections 28, 29, and 30 of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be amended to provide that witness statements, on-board recordings, and communications records referred to in those sections be made available on a confidential basis to those individuals who have been granted full participant status as representatives of parties having a direct interest in the accident investigation; and that all other provisions of sections 28, 29, and 30 of the *CTAISB Act* be amended accordingly in order to give full meaning and effect to the recommended amendments.

- MCR 179 That section 24(2) of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be repealed. The Transportation Safety Board of Canada, in order to preserve its independence, should not be required to send a copy of any draft report on its findings and safety deficiencies that it has identified to each minister, or to any other person with a direct interest in the findings of the board, to provide them with an opportunity to make representations to the board with respect to the draft report, before the final report is prepared.
- The other provisions of section 24 of the *CTAISB Act* should be amended accordingly in order to give full meaning and effect to the recommended repeal of section 24(2).
- MCR 180 That a section be added to the *Canadian Transportation Accident Investigation and Safety Board Act* to provide to each minister and to each party having a direct interest in the findings of the board an opportunity, after completion of the aviation occurrence investigation and the gathering of the evidence, to make formal submissions within a time frame to be prescribed by the board, for consideration by the board in its deliberations.
- MCR 181 That section 26 of the *Canadian Transportation Accident Investigation and Safety Board Act* be amended to incorporate a specific provision entitling a party with a direct interest in an investigation or public inquiry to petition the board for reconsideration of the conclusions of its final report where it is shown that new and material evidence has been discovered subsequent to the conclusion of the investigative process and which might reasonably affect such conclusions or where it is shown that the board's factual conclusions are erroneous.
- MCR 182 That the *Canadian Transportation Accident Investigation and Safety Board Act* be amended to provide that all witness interviews conducted by investigators in connection with an aviation occurrence shall be tape recorded and transcribed.
- MCR 183 That the Transportation Safety Board of Canada add to its roster the names, addresses, and telephone numbers of highly qualified Canadian and international professional experts,

learned in the various disciplines, who are willing to be called upon to assist in any given aviation occurrence investigation. Such a roster should be maintained and updated in consultation with the Canadian aviation community.

MCR 184 That the Transportation Safety Board of Canada, as a matter of policy, establish a closer liaison with the National Aeronautical Research Establishment and the National Research Council Canada and, on an ad hoc basis, utilize to the fullest their facilities and staff experts in various applicable disciplines, to assist in the investigation of aviation accidents.

MCR 185 That sections 24(5) and 24(6) of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be amended to empower the board with the responsibility and authority under law to track and follow up on an ongoing basis the action taken by the minister of transport with respect to each board safety recommendation and, if no action is taken by the minister within a specified time frame, to require an explanation in writing by the minister therefor. There should be a legislated mode of procedure that causes Transport Canada to commit itself to a resolution date, within a specified time frame, with respect to all board recommendations that are accepted by the minister, with an explanation for the time frame contemplated. In the event that the minister's action varies from the board recommendation, or if the minister proposes to take no action with respect to a recommendation of the board, then written reasons therefor should be provided to the board, and such reasons should be made available to the public.

The other provisions of section 24 of the *CTAISB Act* should be amended accordingly in order to give full meaning and effect to the noted recommended amendments.

MCR 186 That the annual report of the Transportation Safety Board of Canada continue to set out, as it now does, all of the recommendations, whether interim or final, that have been made by the board to the minister in the preceding year, but that it add comment regarding the actions taken by the minister in regard thereto.

- MCR 187 That the Transportation Safety Board of Canada provide forensic training to all its scientists and that the board call upon such outside resources as are necessary to assist them with such training.
- MCR 188 That the Transportation Safety Board of Canada formally adopt a policy recognizing that the investigation of human factors involved in an aviation occurrence is a legitimate pursuit and an important element of the investigatory process.
- MCR 189 That the Transportation Safety Board of Canada formally adopt a policy recognizing that it is appropriate for the board to draw inferences of fact based on a preponderance of evidence and to refer to such inferences in its decision-making process.

42 AVIATION INCIDENT AND OCCURRENCE REPORTING AND THE ISSUE OF PILOT CONFIDENTIALITY

The issue of whether statements and reports made by pilots with respect to aviation occurrences or incidents are entitled to privilege on the basis of confidentiality, and therefore inadmissible as evidence, arose during the course of the hearings of this Commission. Counsel for Air Ontario and for the Canadian Air Line Pilots Association (CALPA) asserted a claim of entitlement to privilege on the basis of confidentiality and objection to their production with respect to the following documents:

- The questionnaires and contemporaneous notes completed by Captain Ronald Stewart, the Air Ontario flight safety officer, in relation to his telephone interviews with five Air Ontario F-28 pilots about the F-28 operations, following the March 10, 1989, crash at Dryden.
- All incident reports relating to Air Ontario F-28 aircraft C-FONF and the sister aircraft C-FONG.
- The incident and occurrence reports that had been filed by Captain George Morwood and First Officer Keith Mills while they were in the employ of Air Ontario Inc. or its predecessor companies.

Counsel for Air Ontario and for CALPA argued that air carrier pilots submit incident reports in the belief they are confidential. They suggested that if such confidentiality is breached, pilots will be less forthcoming and frank in disclosing information about incidents, and the circumstances in which they occurred, to airline management. They predicted a potential chilling effect on the reporting of incidents, and argued that the release of incident reports and questionnaires would compromise rather than facilitate improvements in aviation safety.

Counsel for CALPA further argued that if the identity of pilots making incident reports were disclosed, this source of information would dry up. In contrast, counsel for the chief coroner of the Province of Ontario, for the surviving passengers and the families of victims, and for the *Toronto Star* and the Canadian Press, all of whom were granted intervenor status with respect to this issue, argued in favour of the

disclosure of the material in question and the identity of its authors. They argued that disclosure was in the public interest and that the value flowing from disclosure far outweighed any negative impact such disclosure might have on the candour and willingness of pilots to make such reports in the future. Counsel for the Government of Canada, although in favour of disclosure of the material in question, argued that the identity of pilots should be kept confidential.

The issue was ultimately resolved to the satisfaction of counsel for all parties. Captain Stewart and the pilots waived any possible privilege based on confidentiality and agreed to the production of the documents in question. They also agreed to testify voluntarily before this Inquiry.

Notwithstanding this result, I deem it appropriate to comment on this issue because of the widespread interest in the subject of pilot confidentiality within the aviation community. I want to explain the objectives of the Commission in pursuing this evidence and hope to clarify, to the extent possible, the pilots' confidential incident-reporting system.

Background

Captain Ronald Stewart was the Air Ontario Inc. flight safety officer at the time of the crash of flight 1363 and in the months following. While conducting an internal investigation into the crash, he interviewed five Air Ontario F-28 pilots by telephone on various aspects of the Air Ontario F-28 operation. In the course of each of the interviews, Captain Stewart completed a questionnaire he had prepared and made notes of the pilots' responses. He told the pilots that their interviews with him were confidential.

Captain Stewart was himself interviewed by Commission of Inquiry staff in the course of the investigation of the March 10, 1989, crash. He informed the Commission interviewers of the nature of the responses he had received from the five pilots, without divulging their names. On the advice of Air Ontario counsel, Captain Stewart withheld his contemporaneous notes of the five pilot interviews, the completed questionnaires, and the names of the pilots.

Correspondence subsequently passed between counsel on behalf of the Commission and counsel to Air Ontario in which the Commission sought production of the completed questionnaires, the contemporaneous notes, the names of the five pilots, and reports and other materials prepared or received by Air Ontario in connection with incidents involving the F-28 aircraft. Counsel for Air Ontario, supported by counsel to CALPA, refused to produce the information requested, claiming that any such action "would have a chilling effect on the

reporting of incidents generally and a detrimental effect on the flight safety program" (Exhibit 576, appendix 3).

Despite considerable discussion between Commission counsel and counsel to Air Ontario and CALPA whether all the information and documentation relating to the crash of flight 1363 should be produced to the Inquiry, counsel for Air Ontario, supported by counsel to CALPA, continued to refuse such production. When no resolution appeared to be forthcoming on a consensual basis among counsel, I issued a subpoena *duces tecum* on February 22, 1990, to be served on Captain Stewart requiring his attendance before the Commission and requiring him to produce the documentation in question.

On April 23, 1990, during the course of the hearings of this Commission to which Captain Stewart was summoned as a witness, a claim of privilege, based on confidentiality, was asserted by counsel representing Air Ontario and CALPA. This claim was made with respect to the proposed introduction into evidence by Commission counsel of the questionnaires completed by Captain Stewart. In addition, objection was taken to the identification and proposed calling of the five pilots as witnesses, and to the introduction of evidence of incident reports involving the F-28 aircraft as well as incident reports specifically involving Captain George Morwood and First Officer Keith Mills. It was proposed, in the alternative, that I receive the documents in a sealed envelope and that I consider them privately, without public disclosure of the contents or revelation of the identity of the pilots. I summarily dismissed this proposal as inappropriate, particularly in the case of a public inquiry.

The proposal by Commission counsel to put forward this evidence was strongly supported by counsel for the chief coroner of the Province of Ontario; by counsel for the victims' families and the survivors; and by counsel for the *Toronto Star* and the Canadian Press, who were granted intervenor status in this regard. An adjournment with respect to this issue was granted to May 22, 1990, to allow counsel to prepare written submissions in support of their respective positions.

Detailed written arguments were in fact produced by counsel for all of the concerned parties. On May 22, 1990, the hearing into the issue of pilot confidentiality resumed. Commission counsel proposed to begin by calling Captain Stewart and the five pilots to give evidence regarding the circumstances under which the statements by the pilots were made.

At this time, counsel for both Air Ontario and CALPA indicated they had no objection to Captain Stewart's being called as a witness or to his disclosing the nature of the information obtained from the five pilots. However, they strenuously objected to his being required to identify the pilots, and they remained totally opposed to the pilots being called as witnesses.

After I had heard considerable argument by counsel I was of the view that a two-stage process was involved in deciding the issue. The first stage was to determine the circumstances on which the claim for privilege based on confidentiality was founded. Obviously, if no offer had been made by Captain Stewart to give rise to the cloak of confidentiality, that would end the matter. If, however, it was found from the evidence that an offer of confidentiality had been made to the five pilots, then it would be necessary to go on to the second step to determine whether the pilots' statements to Captain Stewart were in fact privileged in law.

In my view, the best possible evidence of whether a statement was made in confidence was that of the person who actually made the statement. Counsel for Air Ontario and CALPA urged that only Captain Stewart be called in this regard and that the five pilots neither be identified nor called as witnesses at this stage of the proceedings. This position was tantamount to hearing only one-half of the story and was clearly unacceptable in a public forum.

In addition, counsel for the provincial coroner of Ontario moved for an order excluding witnesses during Captain Stewart's testimony. In opposing this motion, counsel for Air Ontario and CALPA argued that the five pilots occupied a position analogous to that of an accused in a criminal matter or a party to a civil proceeding and that they ought not to be excluded. Following all of the argument, I made the ruling set out hereunder.

Ruling of the Commissioner Made on May 22, 1990

It strikes me that there is really no analogy between the position of these pilots and a party accused in a criminal matter and a party in a civil action. I don't think I can come to the conclusion that you suggest, Mr Keenan, with respect to the pilots.

In this matter, it is not in dispute that five Air Ontario F-28 pilots gave certain information to their safety officer, Captain Stewart, after the March 10th crash at Dryden and that Captain Stewart recorded this information.

Commission Counsel proposes to call Captain Stewart and the five pilots in order to establish the circumstances under which the information was given to Captain Stewart by these pilots, and he argues that those circumstances are relevant to the larger issue of privilege based on confidentiality which is being asserted on behalf of those pilots with respect to that information.

This is a two-stage issue. The first stage involves the circumstances out of which a claim for privilege based on confidentiality

arises. The second stage involves examining the issue of whether or not a claim for privilege can be sustained on the basis of confidentiality. At this point, we are concerned only with the first stage.

Counsel for Air Ontario and for the Canadian Airline Pilots Association representing the five pilots argue that the pilots who gave statements to Captain Stewart should not be called as witnesses at this stage, nor should their identities be made public prior to a decision being made on the larger issue of privilege itself. It is suggested that I hear only the evidence of Captain Stewart on this point. However, to hear the evidence of Captain Stewart alone would be to only hear one side of the story.

The question is not so much one of whether an offer of confidentiality was made but whether that information which was received by Captain Stewart would not have been given to him by the pilots in question in the absence of an undertaking as to confidentiality.

The available jurisprudence on the subject indicates that a tribunal faced with a claim of privilege on the basis of confidentiality must hear evidence as to the circumstances giving rise to such claim. In this case, I can think of no evidence more germane to the issue of such circumstances than that of the five individuals with respect to whom a claim for privilege is being asserted on the basis of confidentiality.

The circumstances under which the statements in question were given go to the very heart of the matter. That evidence can only be given by the pilots themselves. Position statements made by counsel on their behalf is not evidence.

In short, in order to intelligently adjudicate on the main issue, I feel that I have to hear those who claim privilege and their evidence must be subject to the tests of cross-examination.

At this stage, no reference to the content of the actual statements given by each of the pilots will be made. It is already public knowledge that certain statements were made.

In my view, it cannot reasonably be inferred that any injury will accrue to these pilots or to the general pilot group by merely hearing the evidence of the five pilots as to the circumstances under which their individual statements were made to Captain Stewart.

I therefore conclude in all the circumstances of this case that it is appropriate that Captain Stewart and the five pilots be called as witnesses in this stage of the process of ultimately determining the efficacy of the claim for privilege.

Counsel for the Provincial Coroner of Ontario has moved that there be exclusion of witnesses during this phase of the inquiry. This is routinely done in courts at all levels.

Because of the delicate nature of this matter, I deem it to be in the best interests of all concerned including the said pilots themselves that an order for exclusion be made.

I accordingly make the following order:

First, all witnesses who are to be called to testify in this phase of the inquiry shall be excluded from the hearing room while other witnesses testify.

Second, witnesses who are yet to be called to testify are hereby directed not to watch the television monitor at Commission premises during the hearings.

Third, witnesses who are to be called shall not discuss their evidence or the evidence of any other witness with any other person excluding counsel for those persons.

Witnesses who are yet to be called to testify are directed not to read the transcripts of evidence given by other witnesses who have testified ahead of them during this phase of the inquiry.

(Transcript, vol. 74, pp. 72–76)

Shortly thereafter that same day, May 22, 1990, I was told that all counsel had arrived at an agreement on the issue of privilege based on a claim of confidentiality, which precluded the necessity of a protracted hearing before me. The position arrived at by counsel was essentially the following:

- The five questionnaires completed by Captain Stewart during his telephone interviews with the F-28 pilots would be produced to the Commission.
- The contemporaneous notes of the interviews with the five F-28 pilots made by Captain Stewart would be produced to the Commission.
- All incident and occurrence reports relating to the F-28 aircraft would be produced to the Commission.
- All incident and occurrence reports in the possession of Air Ontario, or from other sources, pertaining to Captain Morwood and First Officer Mills would be produced to the Commission.
- The names of the five pilots would be made available to the Commission, and the pilots would all appear as witnesses before me waiving whatever alleged privilege may have attached to the questionnaires completed by Captain Stewart. The pilots in question were Christian Maybury, Deborah Stoger, Angus Moncrieff (Monty) Allan, William Wilcox, and Erik Hansen.

The Five F-28 Pilot Questionnaires and Contemporaneous Interview Notes

Captain Stewart was called to testify on May 23 and 24, 1990. In response to questions by counsel for Air Ontario, he gave the following explanation for his personal decision, as the Air Ontario flight safety officer, to conduct the pilot surveys after the F-28 crash:

Q. ... tell me, sir, why you drafted this survey.

A. Rumours. They're prevalent in every industry, I'm sure. They are very much so in the airline. After the accident, there was many rumours of – surrounding the F-28 operation and what was wrong with it, and I wanted to get to the bottom of it to see if there was any basis for fact.

Also, I had some specific questions, some concerns that had been raised during the investigation, during the on-site investigation out in Dryden, with respect to icing with – or, excuse me, de-icing on aircraft with an engine running and also with respect to, in quotation marks, "hot refuelling," and I wanted to learn what the pilot viewpoints were on those two issues as well.

Q. Now, what use was going to be made of this survey by you once you had it completed?

A. Well, what I intended to use this for was simply to assess whether or not the rumours were true and, assuming the worst, make recommendations to the president with respect to the operation.

Q. So this would be in line with your major responsibilities as you've outlined it on the –

A. Yes, very much so.

(Transcript, vol. 74, p. 98)

Captain Stewart testified that he originally planned to survey all F-28 pilots with Air Ontario but abandoned this plan after the vice-president of flight operations, Mr James Morrison, took great exception to the survey and angrily queried Captain Stewart whether he was conducting a "witch hunt." In his evidence, Mr Morrison conceded he had referred to the pilot survey as a witch hunt:

A. ... And he said, well, what do you mean, Jim, and I said, well, basically, Ron, are you on a witch hunt or are we trying to develop something here?

(Transcript, vol. 115, p. 160)

Q. When you talked to him, did you use the word "witch hunt" in talking to him? Do you recall?

A. I believe I did.

Q. Do you think that choice of terminology on your part may have transmitted your dissatisfaction with the survey to him?

A. In retrospect, yes, I would say that it would, certainly.

(Transcript, vol. 115, pp. 166-67)

The company discontinued the F-28 operation six weeks later, citing commercial reasons for the cancellation of the program.

The contents of the questionnaires and the contemporaneous notes of the pilot interviews made by Captain Stewart were of considerable probative value to the inquiry into the Air Ontario F-28 operations and flight safety program. The principal criticisms cited by the five pilots regarding the F-28 operations concerned a lack of technical direction in the F-28 program and the fact that there was no one in the organization experienced enough to lead the F-28 project. The competence of Captain Joseph Deluce in his role as F-28 chief pilot was also the subject of pilot criticism. Captain Stewart in fact recommended to Air Ontario management that Air Canada be brought in to lead the program. This recommendation was not acted upon.

Other pilot criticisms centred on the lack of Air Ontario F-28 standard operating procedures (SOPs), confusion among pilots as to which of three different flight manuals should be used, poor coordination within the Air Ontario system operations control (SOC) centre, and lack of ground-support facilities at various stations. These matters are explored in greater detail in other chapters of this Report.

Clearly, the information contained in the pilot questionnaires and in Captain Stewart's interview notes was relevant to the issues being considered by this Inquiry and it was, in my view, in the public interest that it be disclosed. I would emphasize that the Commission was duty-bound to pursue all relevant evidence pertaining to the Air Ontario F-28 operation in its search for the contributing factors and causes of the March 10, 1989, crash. All steps taken towards this end, including the introduction into evidence of the five F-28 pilot questionnaires and Captain Stewart's interview notes, were, in my view, consistent with the laws of Canada.

I propose now to outline and comment on the powers of a Commission under the *Inquiries Act*; the applicable Canadian statutory provisions; the position of the International Civil Aviation Organization (ICAO); the provisions of Air Ontario corporate manuals and forms; and the common law that evolved with respect to privilege and confidentiality in relation to the production of the documents in issue.

Powers of the Commissioner with Respect to the Conduct of the Inquiry

The Order in Council: Procedures

The Order in Council establishing this Commission, dated March 29, 1989, provides that "the Commissioner be authorized to adopt such procedures and methods as he may from time to time deem expedient for the proper conduct of the inquiry."

The Inquiries Act: Summoning Witnesses and Production of Documents

Section 4 of the *Inquiries Act*, R.S.C. 1985, c.I-11, provides:

The commissioners have the power of summoning before them any witnesses, and of requiring them to

- (a) give evidence, orally or in writing, and on oath or, if they are persons entitled to affirm in civil matters on solemn affirmation; and
- (b) produce such documents and things as the commissioners deem requisite to the full investigation of the matters into which they are appointed to examine.

The Order in Council, when read in conjunction with and subject to the terms of the *Inquiries Act* and the common law, suggests that the commissioner is entitled to conduct the inquiry in such a way as to further the objects of his commission and that, to the extent that legal rights are not contravened, is "the master of [his] own procedure." (See *F. Irvine v. Canada* (Restrictive Trade Practices Commission), [1987] 1 S.C.R. 181.)

Canadian Statutory Provisions

There are no statutory provisions to assist a commissioner in determining whether the documents in issue should be produced. However, some mention should be made of the Air Navigation Order (ANO) Series VII, No. 2; the *Canada Evidence Act*, R.S.C. 1985, c.C-5, as amended; the *Canadian Aviation Safety Board Act*, R.S.C. 1985, c.C-12, and the Regulations thereunder; and the now proclaimed *Canadian Transportation Accident Investigation and Safety Board Act*, S.C. 1989, c.3.

ANO Series VII, No. 2

ANO Series VII, No. 2, which establishes the Standards and Procedures for air carriers using large aircraft, is silent with respect to the aviation occurrence reporting system.

The Canada Evidence Act

Section 37 of the *Canada Evidence Act*, R.S.C. 1985, c.C-5, as amended, permits a minister of the Crown or "other person interested" to object to the disclosure of information on the basis of a specified public interest. The court may examine or hear the information and order its disclosure subject to restrictions or conditions it deems appropriate, if it

concludes that the public interest for disclosure outweighs the specified public interest. For the purposes of the Act, "other person interested" contemplates a person in authority in relation to the public interest specified. (*R. v. Lines* (1986) 27 C.C.C. (3d), 377 (N.W.T.C.A.)). One would be hard pressed indeed to find that either Air Ontario or CALPA would be persons interested within the meaning of the Act and, therefore, entitled to invoke section 37 to their benefit. Certainly I cannot come to such a conclusion.

The Canadian Aviation Safety Board Act

The *Canadian Aviation Safety Board Act*, R.S.C. 1985, c.C-12, created the now defunct Canadian Aviation Safety Board (CASB), a statutorily mandated board with broad powers to, *inter alia*, search and seize property, compel individuals to attend and give evidence under oath, compel the production of medical records, and conduct public inquiries into aviation occurrences.

The provisions of the *Canadian Aviation Safety Board Act* are of no assistance to Air Ontario or to CALPA in this matter. While the legislation creates a privilege for specifically defined statements, the privilege clearly attaches only to statements obtained by the board or an investigator for the board. Notwithstanding this, where the production of a statement is contested on the grounds that it is privileged, the court (defined to include a commission under the *Inquiries Act*) is to review the statement in camera and may order production if it concludes that "the public interest in the proper administration of justice outweighs in importance, the privilege attached to the statement by virtue of section 38."

There are no provisions in the *Canadian Aviation Safety Board Act* that afford any individual (such as Captain Stewart and each of the five F-28 pilots), corporation (such as Air Ontario), or association (such as the Canadian Air Line Pilots Association) any privilege, degree of protection, or confidentiality in the gathering of occurrence or incident reports or any other documents or information pertaining to the safety of the operation of an air carrier.

Canadian Aviation Safety Board Regulations

The Canadian Aviation Safety Board Regulations established a mechanism for anonymous and confidential reporting of aviation-related concerns to the board. Section 6 of the Regulations provides as follows:

Voluntary Reporting

- 6.(1) Any person having knowledge of an aviation occurrence who is not required to report the occurrence pursuant to section 3, 4 and 5 may report to the Board any information that the person wishes to report.
- (2) Where a person reports to the Board pursuant to subsection (1), the person may, by using the form set out in the schedule, request that his identity and any information that could reasonably be expected to reveal his identity not be released.
- (3) Where a report is made to the Board by using the form set out in the schedule,
 - (a) the report shall be examined exclusively by officers of the Board specifically designated by the Board to examine the report; and
 - (b) the Board shall return the removable identification strip on the form to the address appearing on the strip within 10 clear days from its receipt of the report.
- (4) Where a person reports to the Board pursuant to subsection (1) by using the form set out in the schedule, no person shall release, or cause to be released, the identity of the person making the report or any information that could reasonably be expected to reveal his identity, unless the person making the report authorizes, in writing, such release.

The confidential aviation safety reporting system provided for by section 6 is the only method provided by statute or regulation whereby aviation occurrences may be reported in a confidential manner.

A brochure published by the Canadian Aviation Safety Board (CASB) entitled *Reporting in Confidence* describes the system in the following terms: "A new mechanism, using a reporting form provided by the Board, is available for those wishing to protect their identity when voluntarily reporting aviation occurrences. The program is designed to gather information not provided under the other systems." The "other systems" referred to are the mandatory and voluntary reporting systems:

Mandatory – Existing regulations require that all civil aircraft accidents and missing aircraft as well as certain types of incidents be reported to the CASB. The mandatory reporting of incidents presently applies only to aircraft weighing more than 5,700 kg and covers specified types of incidents such as engine failure, smoke or fire in the aircraft and near collisions ...

Voluntary – The voluntary system is concerned with incidents, situations or conditions involving aircraft weighing more than 5,700

kg that are outside mandatory reporting requirements, and all those involving aircraft weighing less than 5,700 kg.

(Exhibit 577, Document 4)

Thus, there are no provisions in the Canadian Aviation Safety Board Regulations that afford any individual, corporation, or association any degree of protection or confidentiality in the gathering of occurrence or incident reports or any other documents pertaining to the operation of an aircraft, except to the extent provided for an individual who avails himself or herself of the mechanism provided for in section 6 of the CASB Regulations. In fact, it is mandatory to report certain specified incidents involving aircraft weighing more than 5700 kg. No confidentiality whatsoever attaches to such reporting.

The Canadian Transportation Accident Investigation and Safety Board Act

An aviation occurrence is defined in section 2 of the Act as follows:

- (a) any accident or incident associated with the operation of an aircraft, and
- (b) any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in paragraph (a).

This Act effects the replacement on June 29, 1989, of the Canadian Aviation Safety Board (CASB) by the new Canadian Transportation Accident Investigation and Safety Board (CTAISB). There are no provisions in the *Canadian Transportation Accident Investigation and Safety Board Act* for any reporting systems that are different from those in place pursuant to the predecessor *Canadian Aviation Safety Board Act*. As of the date of this Final Report, no new regulations had been passed pursuant to the *CTAISB Act*.

Section 30 of the Act broadens the non-disclosure provisions in the predecessor legislation. Moreover, it includes in subsection (5) a provision allowing for a court to determine issues relating to the production and discovery of a statement made under the Act, where a claim to privilege is asserted, by balancing public interest with the importance of the privilege. Subsection (6) deems a "court" to include an inquiry under the *Inquiries Act*.

Subsections (5) and (6) provide as follows:

- (5) Notwithstanding anything in this section, where, in any proceedings before a court or coroner, a request for the production and

discovery of a statement is contested on the ground that it is privileged, the court or coroner shall

(a) *in camera*, examine the statement; and

(b) if the court or coroner concludes in the circumstances of the case that the public interest in the proper administration of justice outweighs in importance the privilege attached to the statement by virtue of this section, order the production and discovery of the statement, subject to such restrictions or conditions as the court or coroner deems appropriate, and may require any person to give evidence that relates to the statement.

- (6) For the purposes of subsection (5), “court” includes a person or persons appointed or designated to conduct a public inquiry into a transportation occurrence pursuant to this Act or the *Inquiries Act*.

Clearly, even confidential statements made under the statutory protection of section 30 of the *CTAISB Act* are, at the instance of a court, in a proper case, subject to disclosure.

Position of the International Civil Aviation Organization

The position of ICAO with respect to disclosure of any records, including the statements of pilots made in the course of an accident or incident investigation, is unequivocal. Such records or information enjoy no legal privilege.

Paragraph 5.12 of Annex 13 to the Convention on International Civil Aviation relating to international standards and recommended practices, aircraft accident investigation, states as follows:

Disclosure of Records

- 5.12 When the State conducting the investigation of an accident or incident, wherever it occurred, considers that disclosure of any of the records, described below, might have an adverse effect on the availability of information in that or any future investigation then such records shall not be made available for purposes other than accident or incident investigation:
- a) statements from persons responsible for the safe operation of the aircraft;
 - b) communications between persons having responsibility for the safe operation of the aircraft;
 - c) medical or private information regarding persons involved in the accident or incident;

- d) cockpit voice recordings and transcripts from such recordings;
- e) opinions expressed in the analysis of information, including flight recorder information.

(Exhibit 577, Document 11)

Attachment D to Annex 13

Attachment D to Annex 13 provides guidance to the interpretation of paragraph 5.12. It appears to modify the provisions of paragraph 5.12 to the extent that the appropriate authority must determine whether in the use of records, including pilot statements given in confidence, the proper administration of justice outweighs any adverse impact such use may have in future investigations. It provides:

ATTACHMENT D. DISCLOSURE OF RECORDS

Practical applications of 5.12

...

- [4] a) in the spirit of 5.12, the records specified therein should not be made available to civil, administrative or judicial proceedings unless the appropriate authority determines that the proper administration of justice outweighs the adverse domestic and international impact such action may have on that or any future investigations;

(Exhibit 577, Document 11)

The standards and recommended practices of Annex 13 have no legally binding power. Furthermore, any member states that are signatory to Annex 13 and find it impractical or impossible to comply with a given standard or practice may at any time notify a "difference" and opt out. As of January 15, 1989, Canada and 14 other states had notified ICAO of differences with respect to paragraph 5.12 of Annex 13. The "difference" filed by Canada simply states:

5.12 Present Canadian legislation precludes the possibility to guarantee that the documents outlined could be afforded any protection from disclosure.

It is readily apparent that no degree of protection from disclosure or confidentiality can be invoked by any individual, corporation, or association pursuant to Annex 13. The Government of Canada, by filing a "difference," has made it abundantly clear that no protection from disclosure based on ICAO standards and recommended practices can be assumed or relied upon.

Applicability of Air Ontario Manuals and Forms

The Air Ontario Flight Operations Manual contains specific sections pertaining to aviation occurrences, accidents, and reportable incidents as well as the circumstances, by whom and to whom, under which reports are to be made. There are no provisions whatsoever in the manual which state or even remotely suggest that any information contained in aviation occurrence reports, accident reports, or incident reports, including the names of the operating crew members, will be treated as being confidential, privileged, or in some other manner protected. Furthermore, the various forms that were to be used by crews to record incidents were intended for a fairly wide distribution. Only one Air Ontario incident report form had three options to be checked off under the headings "Operational," "Flight Safety," or "Anonymous." A number of Air Ontario pilots who testified before me were uncertain as to the use and meaning of the "anonymous" option.

It became quite clear from the evidence of Air Ontario pilots and managers, and from the manuals and forms they used, that there were no corporate directives or individual expectations that Air Ontario had some type of formal confidential reporting system. This simply was not the case.

Past Practices of Commissions of Inquiry

The confidentiality of accident investigation procedures was discussed by Mr Justice Dubin in his *Report of the Commission of Inquiry on Aviation Safety* (vol. 1, May 1981). While the Dubin Commission did not deal with privilege issues in relation to pilot incident reports and questionnaires, there was controversy with respect to disclosure of material gathered by aviation safety investigators.

Mr Justice Dubin reviewed several case studies in the report, including the crash of a Pacific Western Boeing 737 at Cranbrook, British Columbia. Litigation was commenced against the Department of Transport by Pacific Western Airlines as a result of this crash. The Department of Justice began to collect documents relating to the crash for the purposes of production on discovery, but members of the aviation safety investigation division who inquired into the Cranbrook crash refused to produce certain documents relating to their examination. They maintained that it would frustrate their efforts to obtain full and frank disclosure from individuals if those communications did not remain strictly confidential.

In his comments, Mr Justice Dubin concluded that no privilege attached to the materials gathered by the investigators. He suggested in his report, however, that it might be appropriate to introduce legislation that would provide for confidentiality of the type sought by the aviation safety investigation division (pp. 210–13). Such provisions subsequently surfaced in the Regulations to the *CASB Act*.

In his Report, Mr Justice Dubin referred to the United States experience:

The main ground advanced by those asserting that a privilege should be attached to all statements obtained by the investigators in the course of their investigations is that witnesses would refuse to provide information to accident investigators if these statements could become admissible in legal proceedings. Those who advanced this position opined that this would happen. These opinions were equally matched with the opinions of others that no such result would flow. It has not been the experience of the National Transportation Safety Board in the United States, where witnesses' statements enjoy no privilege, that their sources of information have dried up. Conversely, there is a danger that witnesses who are assured that their information will not be challenged, nor come under public scrutiny, may take liberties with the facts. This may impair public confidence in the reliability of accident reports.

The practice of accident investigators of assuring confidentiality to those being interviewed should not be encouraged since the investigator cannot in all circumstances carry out his pledge of confidentiality.

In my opinion no satisfactory arguments have been advanced which would warrant any rule of absolute privilege to be attached to witnesses' statements.

(Report of the Commission of Inquiry on Aviation Safety, vol. 1, pp. 239–40)

While the documents sought from the aviation safety investigators in the Cranbrook crash were ordered produced, it should be pointed out that the documents and pilot information in issue before this Commission were different in the sense that they were internal to Air Ontario and were not prepared or produced for the purposes of assisting aviation safety investigators in their efforts to determine the cause of the Dryden crash. For this reason, it is my view that both Air Ontario and CALPA are in a much more tenuous position in asserting a claim to privilege with respect to those documents and pilot information than was the case in the Cranbrook crash investigation.

The Documents in Issue: The Common Law

Taking into consideration the broadly stated objectives of the Order in Council and the absence of statutory direction with respect to the receipt and admissibility of the documents in issue, I conclude that I should be guided in my decision by the common law principles on privilege and confidentiality.

Evidentiary exclusion on the grounds of privilege is an exception to the presumed rule that all relevant evidence is to be placed before the trier of the fact. Wigmore addressed this fundamental principle of law in the following terms:

For more than three centuries it has now been recognized as a fundamental maxim that the public (in the words sanctioned by Lord Hardwicke) has a right to every man's evidence. When we come to examine the various claims of exemption, we start with the primary assumption that there is a general duty to give what testimony one is capable of giving and that any exemptions which may exist are distinctly exceptional, being so many derogations from a positive general rule.

(John Henry Wigmore, *Evidence in Trials at Common Law*, vol. 8, revised by John T. McNaughton [Boston: Little, Brown 1961], p. 70)

This fundamental principle was noted by authors Sopinka and Lederman, who stated there is an onus on a party asserting a privilege to establish why an exemption should be recognized:

The extension of the doctrine of privilege consequentially obstructs the truth-finding process, and, accordingly, the law has been reluctant to proliferate the areas of privilege unless an external social policy is demonstrated to be of such unequivocal importance that it demands protection.

(John Sopinka and Sidney N. Lederman, *The Law of Evidence in Civil Cases* [Toronto: Butterworths 1974], p. 157)

Prior to 1975, common law privileges were generally restricted to communications between solicitor and client, spouses, national security (state secrets), and to briefing assembled in the course of litigation. Inasmuch as the documents in issue do not fall into any of these categories, they clearly would have been subject to production.

In 1975 the Supreme Court of Canada in *Slavutych v. Baker* (1976) 1 S.C.R. 254 appears to have extended the common law to recognize privilege for confidential communications in narrow circumstances. Mr Justice Spence, adopting a test previously advanced by Wigmore, was prepared to grant a qualified privilege to confidential communications if four conditions were met:

1. The communications must originate in a confidence that they will not be disclosed.
2. The element of confidentiality must be essential to the full and satisfactory maintenance of the relation between the parties.
3. The relation must be one which in the opinion of the community ought to be sedulously fostered.
4. The injury that would inure to the relation by the disclosure of the communications must be greater than the benefit thereby gained for the correct disposal of the litigation.

The four conditions set forth in *Slavutych v. Baker* have been judicially interpreted in a number of decisions. One author commented that the *Slavutych* decision is capable of an equitable and evidentiary interpretation:

If the equitable interpretation is the correct one then the case simply stands for the proposition that a party who makes a promise of confidentiality in return for information may not subsequently make use of that information as evidence against the promisee. The equitable principle of confidentiality does not prevent the court from compelling the disclosure of some confidential information at the instance of some third party.

(Peter Sim, "Privilege and Confidentiality: The Impact of *Slavutych v. Baker* on the Canadian Law of Evidence," *Advocates Quarterly* 5 (1984-85): 360)

If one adopts the evidentiary approach, "a privilege could be granted in respect of a confidential communication even if both parties to the communication were strangers to the action" (*ibid.*).

The issue of qualified privilege of confidential communications was more recently canvassed by the Supreme Court of Canada in *Moyse v. Alberta* (Labour Relations Board) (1989), 60 D.L.R. (4th) 1 (S.C.C.). In this case the Supreme Court considered the decision of the Alberta Labour Relations Board, which ordered a journalist to give evidence with respect to her sources. The board applied Wigmore's test as adopted in the *Slavutych* decision and determined that the journalist did not fall within the scope of a "qualified testimonial privilege" either under common law or the Charter. Interestingly, Mr Justice Sopinka qualified his remarks relative to *Slavutych* by stating: "Even if a such qualified

testimonial privilege exists in Canada this appeal must be dismissed as the appellant here does not fall within any of the possible tests which have been proposed as establishing the conditions necessary to justify a refusal to testify" (p. 1578).

In light of these comments, it could be argued that it is still not clear whether the Wigmore test is part of the law of Canada. If one takes the position that Mr Justice Spence's adoption of the Wigmore test is obiter, then production of the documents in issue should clearly not be refused since there is no common law or statutory prohibition that Air Ontario or CALPA could properly rely on in support of exclusion.

On the assumption that the Wigmore test is to be the appropriate test in the circumstances, however, the question is whether the applicants have met the four criteria enunciated by Wigmore.

In the case of *Re: Abel et al. and Director, Penetanguishene Mental Health Centre* (1979) 24 O.R. (2d) 279, the court in dealing with the question of the admissibility of confidential information stated that the courts have generally shown great sensitivity to the need for investigating bodies to rely to some extent on confidential information.

In the present case a balance had to be struck between the need of the community to know the full details and circumstances surrounding the crash and a potential risk that pilots might not be so forthcoming in the future in the completion of reports related to the carrying out of their duties. Although counsel did not present oral argument on their respective positions because the issue was eventually disposed of by agreement, they did, prepare and present to me very full and comprehensive written arguments, which I have considered at length.

Dealing with the first condition of the Wigmore test, although it is questionable whether the information in issue here can be said to have been given "in a confidence that [it] will not be disclosed," for the purposes of this exercise I will assume that this was in fact the case and that the first branch of the test has been met.

I did not hear a great deal of evidence from pilots on the second condition of the Wigmore test – whether confidentiality is essential to the satisfactory maintenance of the relationship – but I did hear some. Based on the evidence I heard and the arguments of counsel, I am of the view that, in the case of aviation safety and accident prevention programs, the assurance to pilots of confidentiality with respect to incident reporting is not only highly desirable but also essential to the satisfactory maintenance of the relation, subject only to a caveat in the case of aviation accident investigation, a matter with which I will deal in my comments regarding the fourth Wigmore condition. I will therefore assume for the purposes of this discourse that the second condition of the Wigmore test has been met.

The third Wigmore condition requires that the relationship be one that the community believes should be fostered. While it may be the view of the community that relations such as solicitor/client, husband/wife, patient/physician should be fostered, it is doubtful that the general community has an overwhelming sense that the management, flight safety officer(employer)/pilot (employee) confidence relationship must be maintained in the case of the investigation of an air accident.

Finally, it is my view that, even if the first three conditions were met, Air Ontario and CALPA could not meet the fourth Wigmore condition that the injury to the relation by the disclosure must be greater than the benefit thereby gained. The potential of injury to the management, flight safety officer (employer)/pilot (employee) relation because of disclosure in the course of an air carrier accident investigation of pilot incident or occurrence reports made in confidence is an extremely remote possibility, given the fact that air carrier accidents are a relatively rare occurrence. In my view the remoteness of the possibility of disclosure ever occurring is a factor to be considered in the balancing of interests.

It is certainly questionable whether pilots or other employees of an airline realistically expect that incident and safety reports given by them, in confidence, and in the context of an air carrier's flight safety or accident prevention program will not be disclosed during the investigation of the uncommon event of an air crash. In fact, some pilots have so indicated in their testimony. It is clearly in the best interests of the pilots themselves, as well as the public, that aviation safety be enhanced by the lessons to be learned from thorough and complete aviation accident investigations.

Having regard to all of the circumstances, I have no difficulty whatsoever in concluding that the injury that might or would inure to the relation is far outweighed by the public benefit realized through the full investigation of air disasters and the remedial actions that may follow to prevent future accidents. The balance, with respect to the question of privilege regarding the documents and information in issue, must, in the case of an aviation accident investigation, surely be tilted in favour of full access, recognizing the general public good.

Conclusion

Having reviewed the legal principles that govern the privilege or confidentiality of statements and reports made by pilots, it seems appropriate to comment generally on the application of such principles to the aviation community.

The evidence shows there are two distinctly different situations in which the issue of privilege/confidentiality arises. The first is in the

context of accident prevention, and the second is in the context of accident investigation. The difference is fundamental.

It is clearly in the interest of accident prevention that pilots be able to author incident reports and complete flight safety-related surveys on a confidential basis, in order to avoid the possibility of harassment or adverse reactions from their employers. Such a regime deserves the fullest support since it obviously promotes candour and honesty. It is for this reason that some air carrier employers use anonymous or non-attributable incident-reporting systems. When such systems are established, however, it ought to be clearly understood they are for the purpose of accident prevention and intended for the furtherance of aviation safety practices. Fortunately, major airline accidents are a relatively rare occurrence, and the occasions on which the confidence of pilot incident reports are likely to be breached in the public interest are rare.

Captain Stewart, the Air Ontario flight safety officer, set up an informal, confidential incident-reporting system for pilots at Air Ontario as part of a safety and accident prevention program, without direction or authority from his employer. Under this system, pilots could report aviation incidents to the flight safety officer, in order to further the safety and accident prevention program of the carrier, with Captain Stewart's assurance that their identity would not be disclosed. Well intentioned as it was, Captain Stewart's offer of confidentiality to the five F-28 pilots, in return for their candour and cooperation in reporting on the F-28 program following the Dryden crash, can only have application in the context of Air Ontario's accident prevention program. It cannot be seen to defeat the introduction of evidence relevant to the aircraft accident investigation itself.

It is an obvious fact that Air Ontario was not charged with the responsibility of the accident investigation into the Dryden crash. Initially that was, by law, the responsibility of the Canadian Aviation Safety Board (CASB) and, subsequently, the responsibility of this Commission of Inquiry. When an aviation accident occurs and an accident investigation begins, the question of privilege for documents or statements previously given by pilots in confidence in the cause of accident prevention becomes an issue for determination by the authority investigating the aviation accident. This cannot be otherwise.

Aircraft accident investigation requires a thorough and detailed analysis of every conceivable element that may have had a bearing on an accident. It is inconceivable that the tribunal charged with the investigation of the Air Ontario crash of flight 1363 would not look at all prior incident reports filed by Captain Morwood or First Officer Mills, such reports being highly relevant to the human performance aspects of the crash investigation.

It is further inconceivable that a proper and thorough investigation of the crash of flight 1363 would not include a detailed review of all Air Ontario corporate practices relating to the F-28 program, including the five pilot questionnaires and interview notes completed specifically with respect to that operation. For a public inquiry to conduct an aviation accident investigation without the examination of such evidence in public would be a contradiction in terms. Unless information such as that contained in the pilot questionnaires, the interview notes, the names of the five F-28 pilots, and all applicable incident reports was made public, the credibility of the Commission of Inquiry as the investigative body, and its findings, would be compromised. The reassurance of the public that all possible factors influencing an aviation accident have been thoroughly investigated would, in my view, be seriously undermined if the information in question were to be treated as privileged, on the basis of confidentiality, and beyond the bounds of public scrutiny.

Although I am totally supportive of a confidential pilot incident-reporting system from the perspective of accident prevention, there can be no doubt whatsoever that the greater public interest must prevail and any privilege attaching to pilot incident reports made in confidence must yield in the case of an aircraft accident investigation. Frankly, I doubt that professional pilots would want it otherwise.

43 OBJECTION TO
 PRODUCTION OF
 DOCUMENTS, BASED ON
 A CONFIDENCE OF THE
 QUEEN'S PRIVY COUNCIL,
 SECTION 39,
 CANADA EVIDENCE ACT,
 R.S.C. 1985, c.C-5

During the summers of 1989 and 1990, counsel and technical advisers to the Commission, as part of a system approach to accident investigation of the Dryden crash, conducted extensive interviews with many persons involved with Transport Canada. Such interviews resulted in the review and assessment by officials of this Commission of hundreds of documents and files totalling thousands of pages.

The management of Transport Canada was generally cooperative and helpful in locating and reproducing documents for the Commission. However, as the in-depth examination of Transport Canada records progressed, the senior general counsel from the Department of Justice, who represented Transport Canada at the hearings of this Commission, wrote to Commission counsel on August 30, 1990, objecting to the production of certain documents and information, pursuant to the provisions of section 39 of the *Canada Evidence Act*, and advising, *inter alia*, as follows:

Finally, in case we cannot reach agreement on this issue, I have to tell you that the Government of Canada objects to produce to the Commission documents or information that disclose the contents of submissions by Transport Canada to Treasury Board, on the ground that these are confidences of the Queen's Privy Council for Canada. If the Commission takes steps to compel production of such documents or information, the Government will produce a certificate as contemplated by s. 39 of the *Canada Evidence Act*.

(Exhibit 1329, pp. 2-3)

The provisions of section 39 of the *Canada Evidence Act* are as follows:

- (1) Where a minister of the Crown or the Clerk of the Privy Council objects to the disclosure of information before a court, person or body with jurisdiction to compel the production of information by certifying in writing that the information constitutes a confidence of the Queen's Privy Council for Canada, disclosure of the information shall be refused without examination or hearing of the information by the court, person or body.
- (2) For the purpose of subsection (1), "a confidence of the Queen's Privy Council for Canada" includes, without restricting the generality thereof, information contained in
 - (a) a memorandum the purpose of which is to present proposals or recommendations to Council;
 - (b) a discussion paper the purpose of which is to present background explanations, analyses of problems or policy options to Council for consideration by Council in making decisions;
 - (c) an agenda of Council or a record recording deliberations or decisions of Council;
 - (d) a record used for or reflecting communications or discussions between ministers of the Crown on matters relating to the making of government decisions or the formulation of government policy;
 - (e) a record the purpose of which is to brief ministers of the Crown in relation to matters that are brought before, or are proposed to be brought before, Council or that are the subject of communications or discussions referred to in paragraph (d); and
 - (f) draft legislation.
- (3) For the purposes of subsection (2), "Council" means the Queen's Privy Council for Canada, committees of the Queen's Privy Council for Canada, Cabinet and committees of Cabinet.
- (4) Subsection (1) does not apply in respect of
 - (a) a confidence of the Queen's Privy Council for Canada that has been in existence for more than twenty years; or
 - (b) a discussion paper described in paragraph (2)(b)
 - (i) if the decisions to which the discussion paper relates have been made public, or
 - (ii) where the decisions have not been made public, if four years have passed since the decisions were made. 1980-81-82-83, c.111, s. 4.

A total of 24 documents were withheld by Transport Canada and sheltered from review by Commission staff, and from consideration by me, on the basis of the provisions of section 39 of the *Canada Evidence Act*. More specifically, section 39, subsections (2) (a), (c), (d), and (e),

were relied upon in order to deny the Commission access to those documents in issue.

A certificate was issued by the clerk of the Privy Council on January 8, 1991, pursuant to section 39 of the *Canada Evidence Act*, certifying that the 24 documents in question contained information constituting confidences of the Queen's Privy Council for Canada.

It is noteworthy that such a certificate does not include the following information: a description of the document, including the date of the document; from whom and to whom it was sent; and the general subject matter of the document. The utterly barren nature of the information contained in the certificate with respect to all 24 documents is illustrated by the vague and virtually unintelligible description of document number one:

Document #1 is a copy of a record which consists of information contained in a memorandum the purpose of which is to present proposals or recommendations to Council within the meaning of 39(2) (a).

(Exhibit 1333, attached schedule)

The proceedings of a public inquiry are, by definition, open to the public and are designed to alleviate those concerns and considerations that led to the establishment of the inquiry in the first place. From the perspective of the public interest and the public perception, I have considerable difficulty with the efficacy of the simple expedient of invocation, through the means of a vaguely worded certificate, of section 39 of the *Canada Evidence Act* with respect to documents and information sought by a commission of inquiry established under the *Inquiries Act* by the Government of Canada. When dealing with state secrets and litigious or adversarial interests, the *raison d'être* of section 39, and its invocation in a proper case, can be understood. However, in the case of a public commission of inquiry, I am troubled by the existence of a possibility for arbitrary application of this section to withhold from public scrutiny, for inappropriate reasons, certain documents and information that may be of probative value in the conduct of a full inquiry and essential to satisfying the broad public interest. The claim to confidence in the case of the 24 documents in question, it is reasonable to assume, was initiated by officials within Transport Canada and advanced by counsel for the Department of Justice who represented Transport Canada at the hearings. While not alleging that this was the case in this Inquiry, it is possible to conceive of a situation in which a departmental official or manager may have inappropriate personal reasons, including the concealing of mismanagement, to assert the protection of section 39 against disclosure of incriminating documents. I am strongly of the view that a commissioner appointed under the *Inquiries Act* should be

empowered to make a determination in an in camera hearing as to the appropriateness of the claim to confidence under section 39.

It is noted that certain provisions of the *Canadian Transportation Accident Investigation and Safety Board Act*, in particular section 30 thereof, allows, for example, that statements for which a privilege is claimed may be reviewed by a court or a coroner in camera.

Subsections (5)(a) and (b) of section 30 state as follows:

- (5) Notwithstanding anything in this section, where, in any proceedings before a court or coroner, a request for the production and discovery of a statement is contested on the ground that it is privileged, the court or coroner shall
 - (a) *in camera*, examine the statement; and
 - (b) if the court or coroner concludes in the circumstances of the case that the public interest in the proper administration of justice outweighs in importance the privilege attached to the statement by virtue of this section, order the production and discovery of the statement, subject to such restrictions or conditions as the court or coroner deems appropriate, and may require any person to give evidence that relates to the statement.

It is my opinion that the proper conduct of a public inquiry requires that an amendment be made to the provisions of section 39 of the *Canada Evidence Act* to establish a procedure for an in camera assessment, similar to that provided by section 30(5)(a) and (b) of the *Canadian Transportation Accident Investigation and Safety Board Act*, whereby the commissioner appointed under the *Inquiries Act* to conduct a public inquiry considers whether the public interest in the conduct of the inquiry outweighs in importance the confidence claimed with regard to the document in question under section 39 of the *Canada Evidence Act*. In the alternative, this result might also be achieved by an appropriate amendment to the *Inquiries Act* incorporating provisions similar to those contained in section 30, subsections (5)(a) and (b) of the *Canadian Transportation Accident Investigation and Safety Board Act*. In either event, such a provision would enable the commissioner conducting a public inquiry to determine objectively, in an in camera hearing, whether the public interest in a full and open inquiry outweighs the importance of what is now an unchallengeable and unsupported invocation of an objection under section 39 of the *Canada Evidence Act*, based on a confidence of the Queen's Privy Council.

RECOMMENDATION

It is recommended:

- MCR 190 That section 39 of the *Canada Evidence Act*, R.S.C. 1985, c.C-5, be amended to empower a commissioner appointed under the *Inquiries Act* to make a determination in an in camera hearing as to the appropriateness of an objection, pursuant to the provisions of section 39 of the Act and based on a confidence of the Queen's Privy Council, to production of a document. Such determination should take into consideration the nature of the document in issue and its relevance and probative value to the subject matter of the inquiry, and should weigh the claim to confidence asserted under section 39 of the Act against the public interest in full disclosure of such document. In the alternative, the provisions of the *Inquiries Act* should be amended as required to give full meaning and effect to this recommendation.

44 INQUIRIES ACT, R.S.C. 1985, c.I-11, SECTION 13

Section 13 of the *Inquiries Act* states that:

No report shall be made against any person until reasonable notice has been given to the person of the charge of misconduct alleged against him and the person has been allowed full opportunity to be heard in person or by counsel.

This section of the Act embodies in statute the principle of natural justice, which requires that affected persons be provided with reasonable notice and a fair opportunity to be heard. Because there is little judicial precedent interpreting the specific terms of section 13, its application has tended to vary from one Commission of Inquiry to the next. While I do not propose to conduct a detailed review of the history and jurisprudence that have evolved surrounding this section, I will review the provisions of section 13 and describe how this Commission approached their administration and dealt with their inherent difficulties.

Procedural Fairness

It was my desire and instruction that all proceedings of the Inquiry be conducted in keeping with the principles of procedural fairness and equity. To that end, the following specific procedures were adhered to throughout the course of Commission hearings to ensure that any individual adversely implicated before this Commission, in any respect, had the full right to be heard. It should be noted that all individuals who received letters of notice pursuant to section 13 testified at the hearings of this Commission and, therefore, had the benefit of these procedures.

- 1 All witnesses who might conceivably be adversely affected by these proceedings were advised of their right to counsel, prior to their being interviewed by Commission staff.

- 2 All interviews undertaken by Commission staff of potential witnesses who might be adversely affected by these proceedings were either conducted in the presence of their counsel or with the concurrence of counsel for such witnesses. In some cases such witnesses waived the right to have counsel present during their interviews. Copies of interview transcripts were always made available on request.
- 3 Before a witness testified, a synopsis of such witness's anticipated testimony, based on witness interviews, was forwarded to all participating parties.
- 4 Before a witness testified, photocopies of all exhibits proposed to be introduced through a given witness were forwarded to all participating parties.
- 5 All counsel appearing before me were afforded broad rights of cross-examination of all witnesses.
- 6 All participating parties were afforded the right to file written briefs, as they saw fit, for my consideration.
- 7 All hearings were conducted in such a manner so as to adhere as closely as possible to commonly accepted evidentiary rules.
- 8 All counsel appearing before me were afforded the opportunity to call such further evidence as they saw fit, in addition to the evidence called by Commission counsel.
- 9 All counsel appearing before me were afforded the opportunity to present closing arguments.

To the extent that any party perceived that there were inaccuracies or misstatements on the record, such party, directly or through counsel, was able to take steps to clarify the record – by cross-examining a witness, by adducing new evidence, or by submitting oral or written argument to me. Throughout this process all parties availed themselves of these rights from time to time as they saw fit.

The procedures adopted throughout the Inquiry with respect to the interviewing of witnesses, the adducing of evidence, and the general conduct of the Inquiry were not challenged or questioned by way of judicial review proceedings, or otherwise, by any party or person participating in the Inquiry process.

As an extension of the approach taken throughout the hearings, I have attempted to be as fair as possible in my interpretation of section 13 and in the establishment of procedures to ensure that parties affected at this stage continue to have the protection of procedural fairness, including the right to be heard.

After the hearings of the Commission were concluded on January 24, 1991, I commenced the lengthy process of reviewing transcripts, exhibits, and background informational papers prepared at my request by my staff. By the end of July 1991 the basic direction to be taken was in place

for assessing evidence, making findings, and determining recommendations. From a practical perspective, this was the first time that I was in a position to assess the applicability of section 13 and the procedure to be adopted in that regard.

The Meaning of “Misconduct”

Section 13 states that notice is to be given to persons against whom a “charge of misconduct” is alleged. The *Inquiries Act* does not define the term “charge of misconduct.” This is a basic weakness in the Act.

One of the meanings ascribed to the word “charge” in the Oxford English Dictionary is to “accuse.” By definition, a charge of criminal misconduct is accusatory, as opposed to the civil misconduct with respect to which an “allegation” is normally made.

I therefore have taken the view that the term “charge of misconduct,” as it appears in section 13, *prima facie* encompasses wrongdoing or misconduct of such a nature as to attract a criminal charge. The evidence before this Inquiry, while in some cases disclosing situations that could be seen to be breaches of the provisions of the Air Navigation Orders and/or the Air Regulations, would not in any case support a charge under the criminal law.

On the basis of this interpretation of the meaning of the term “charge of misconduct,” there was in fact no necessity to give any person notice under section 13. However, given that the term is not defined in the *Inquiries Act*, I decided out of an abundance of caution to instruct Commission counsel to give notice to all persons against whom comment might be made in my Final Report which could be perceived to be adverse in nature.

This point was reflected in the following paragraph, which was contained in all the letters of notice that Commission counsel sent to affected parties:

This letter shall constitute notice that the Commissioner will hear and consider any submissions that you or your counsel may wish to make in relation to adverse findings made against you. Although the *Inquiries Act* addresses a “charge of misconduct”, in the interest of fairness, Commissioner Moshansky has directed that notice be afforded to all persons against whom he may make adverse findings. The Commissioner has advised me that he does not view the findings enumerated below as constituting “misconduct” within the meaning of Section 13 of the *Inquiries Act*.

Attached as appendix L is a sample of the correspondence forwarded by Commission counsel to persons affected.

The Meaning of “Reasonable Notice”

Section 13 requires that affected persons be given reasonable notice of the charge of misconduct alleged against them. In addition to the lack of definition in the *Inquiries Act* of the term “misconduct,” a further basic difficulty in administering this section is founded in the lack of direction in that section as to when such notice is to be given. Letters of notice pursuant to section 13 were sent to affected parties by Commission counsel on August 19, 1991, after I was in a position to determine my intended findings.

As previously noted, all individuals who received letters of notice pursuant to section 13 had testified at the hearings of this Commission. It may have been desirable, from the perspective of the affected parties, to serve such notice upon them early in the proceedings of the Commission. However, since the section 13 process is based upon intended findings, from a practical point of view it would have been impossible to extend notice before I had reviewed all of the evidence and the arguments of counsel, and had settled upon the direction that my Report would take.

For example, I considered but rejected the possibility of giving notice to a person before that person’s testimony was heard. This approach seems attractive in that it presents the affected party with the opportunity to respond to allegations at the time of his or her testimony, thereby limiting that person’s involvement with the Commission process to one appearance. In all other respects, however, I found this to be an untenable procedure. To give notice of an intended finding of alleged misconduct before a person has testified under oath is, in my view, premature and presumptuous. Furthermore, because subsequent evidence often affects the matters in issue, it would be inappropriate, if not impossible, to give notice of an intended finding before all the evidence has been heard and considered as a whole.

The only course of conduct that struck me as plausible was to provide notice to affected parties only after I had considered all of the evidence, had developed the basic outline of my Report, and had come to conclusions as to my intended findings. The proceedings of a commission of inquiry are complex and often protracted, with many witnesses being called and a voluminous record being established. Findings made in this Report are based on the record of this Inquiry. Until the basic drafting of the Report is completed it is unrealistic to expect, and virtually impossible to finalize in a meaningful way, findings of misconduct.

The term “reasonable notice” implies that both the time period afforded to an affected party to respond to notice under section 13 and the substance itself of the notice are adequate such that the “full opportunity to be heard” is meaningful.

The *Inquiries Act* provides no indication that the term “person” is limited in its meaning to individuals. Therefore, I instructed Commission counsel to extend notice under section 13 to corporations and government bodies as well as to individuals.

Parties who received notice pursuant to section 13 were offered the opportunity to submit written submissions, or to attend in camera before me, personally or by counsel, and make oral submissions. In keeping with my strongly held view that all proceedings of this Commission were to be conducted in public, submissions received pursuant to section 13 were made part of this Commission’s record.¹

Section 13 Procedure

Once a first draft of this quite substantial Report was completed, the parties against whom I was considering making adverse comments were identified. Letters of notice such as the model appended to my Report as appendix L were forwarded in confidence to all affected parties and their counsel.

The recipients of letters of notice issued pursuant to section 13 responded to the Commission in a variety of ways. A number of affected parties submitted written submissions, others communicated with Commission counsel, either personally or through counsel by telephoning their comments and observations directly to him, and others appeared before me at in camera hearings. The Commission did not respond in any way, nor did it take counter-positions to these submissions.

As noted above, every individual who received a letter of notice pursuant to section 13 had previously testified at the public hearings of this Commission on the very issues that became the subject of my intended findings. All such testimony given at the public hearings was subject to challenge or clarification under cross-examination by participating counsel, including counsel for each affected party. Also, such counsel had the opportunity to call any witness as well as to make final submissions at the close of the public hearings.

¹ Oral submissions received in camera in relation to section 13 notices were transcribed by a court reporter.

Section 13 exists above and beyond these procedural safeguards, and it entitles affected parties yet another opportunity to make submissions on their own behalf. The difference is that submissions made pursuant to section 13 are intended as a direct response to a "charge of misconduct."

The rather complex problems resulting from the provisions of section 13 are very well analysed in a textbook entitled *Commissions of Inquiry* (edited by A.P. Fross, Innis Christie, and J.A. Yogis (Toronto, Calgary, Vancouver: Carswell 1990) at pp. 144-45:

The difficulty with section 13 relates to its administration. How can a commission fairly and at the same time procedurally comply with this provision? If reasonable notice is given during the inquiry, either by specifics in its terms of reference or by allegations during its course, then if the persons affected responded and met the allegations during the course of the inquiry, no special notice need be given under section 13 thereafter. However, if no such notice of allegations of misconduct was given before or during the course of the inquiry, then section 13 must specifically be complied with before the commission's report is delivered. If notice is given literally before the report is released, the opportunity to be heard would be somewhat illusory because the commission would have identified allegations of misconduct in the course of arriving at its conclusion and thus might be said to have effectively made up its mind before notice was given. In such circumstances, one might be forgiven for concluding that the opportunity to be heard was somewhat of a sham. If the commission gives notice after hearing the argument of counsel, the same sort of problem may arise. In any event, in an ideal environment the commission itself should not give notice because the obvious implication is that it may have drawn conclusions in order to draw the indictment. If a formal notice under section 13 is required, it should probably be given privately by commission counsel anticipating all possible findings of misconduct which the commission might make. Further notice can be given if the draft report suggests additional findings of misconduct.

A solution currently in use is to comply with the notice requirement by way of commission counsel's argument. If argument is delivered in writing to all parties and they are given an opportunity to be heard under section 13 thereafter as long as commission counsel's argument is cast broadly enough to include all possible conclusions as to misconduct, then the requisite notice has surely been given. In any event, there is a universal plea for amendment to this clumsy statutory arrangement.

Legal Proceedings Instituted on Behalf of Air Ontario and Certain Named Individuals

Upon receipt of letters of notice pursuant to section 13 on August 19, 1991, Air Ontario and certain affected individuals (hereinafter referred to as the "affected individuals") raised a number of objections, culminating in an application to the Federal Court of Appeal. By virtue of their employment or other association with Air Ontario at the time of the crash, the affected individuals were represented throughout the hearings of this Commission by the same counsel who appeared on behalf of Air Ontario (Paterson, MacDougall).

In general terms, the primary objection raised was that the naming in the Report of affected individuals, that is, those against whom I intended to make comment and findings which could be perceived to be adverse in nature, would violate their rights as guaranteed under section 7 of the *Canadian Charter of Rights and Freedoms*. On October 9, 1991, counsel on behalf of Air Ontario and the affected individuals appeared before me to make submissions.

In a ruling released on October 11, 1991, I rejected the arguments of Air Ontario and the affected individuals and stated, in part:

I am obligated to report to the Governor in Council on my observations and findings based on the evidentiary record before me. To discharge this mandate and to make meaningful recommendations in the interests of aviation safety, it is necessary that such findings and recommendations be supported by an analysis of specific evidence before me. In my view, a proper analysis of the "contributing factors and causes of the crash of Air Ontario Flight 363" requires observations and findings adverse to some organizations and individuals to be made.

In my view, I would be remiss in carrying out my mandated duties as specified in the Order in Council dated March 29, 1989, if I did not specifically name organizations or individuals, where appropriate, to lend clarity to the narrative of events and to identify clearly and without ambiguity the particular events that in my view contributed to the crash, or that give rise to my specific recommendations concerning aviation safety.

To refer only to nameless and unspecified individuals could do an injustice by casting a cloak of doubt over the conduct of other individuals, who are blameless, and others who did not have the opportunity to appear before me and be heard. This I am not prepared to do.

In my view there is no conflict between the way in which I propose to fulfil my terms of reference and the requirements of

natural justice, or, in *Charter* terms, the requirements of fundamental justice.

Included in appendix M, attached to this Report, is the full text of my ruling dated October 11, 1991.²

Air Ontario and the affected individuals (the applicants) commenced an application for judicial review in the Federal Court of Appeal seeking an order to set aside my ruling of October 11, 1991, and "prohibiting [the Commissioner] from naming individuals in the report in a manner which would causally link those individuals to the cause of the crash of Air Ontario aircraft C-FONF." [Notice of Application.]

A preliminary motion brought by the applicants before the Honourable Mr Justice Hugesson on October 28, 1991, in the Federal Court of Appeal, for an order to seal the court record was dismissed. Sealing the record would have precluded the media from reporting on the judicial review application, and particularly from reporting the names of the affected individuals. In rejecting the applicants' argument, Mr Justice Hugesson made it clear that he was not prepared to see these proceedings occur in secret.

Thereafter, Air Ontario and the affected individuals abandoned their substantive application respecting the naming of individuals in the Report, and they submitted written responses to the notice of intended findings. As was the case with all other submissions received pursuant to section 13, I considered these submissions carefully and, where warranted, incorporated changes into the Report.

This process tends to be unwieldy and cumbersome. In this case it substantially increased the work of the Commission, diverting human resources for a considerable period of time away from the task of finalizing this Report and in fact delaying its completion by approximately two months. Some recipients of letters of notice pursuant to section 13 conveyed to the Commission their surprise and concern at receiving letters of notice at a stage in the proceeding so long after their own involvement. The section 13 process is an awkward legal procedure. It requires a commissioner, after he or she has heard and considered voluminous evidence, in my case over a period in excess of two years, to disclose his or her intended findings to the affected parties and to invite further submissions in response. Thereafter, a due consideration of the submissions involves a time-consuming reassessment of relevant evidence in the context of the response received.

² The names of affected individuals have been deleted from this ruling. After the Federal Court of Appeal rejected their motion to seal the court record, none of the affected individuals chose to pursue the application, or to permit their names to be released publicly. Accordingly, the names of the affected individuals are not reprinted in this context.

The section 13 process is not unlike that facing the Transportation Safety Board of Canada (TSB, the former CASB), under the *Canadian Transportation Accident Investigation and Safety Board Act*, with respect to which I have negatively commented in chapter 41 and which comments in my view are equally applicable to section 13 in the present circumstances.

After carefully reviewing all submissions received in response to the section 13 notices, on balance I found the section 13 process to be largely unproductive. Although the submissions were generally thoughtful, I found that in most instances the matters raised in the submissions of the affected parties had already been addressed and dealt with in the draft of my Final Report. In some instances, the Final Report was amended in a minor way to reflect a valid comment. Overall, however, the responses received did not generate any substantive changes to the intended content of my Final Report. I therefore question, in the case of an Inquiry conducted as a quasi-judicial proceeding with the parties represented by counsel throughout and under the procedures already described, whether the section 13 provisions should apply at all.

RECOMMENDATION

It is recommended:

- MCR 191 That the provisions of section 13 of the *Inquiries Act* be reconsidered and that, at a minimum, appropriate amendments be introduced to provide:
- (a) a definition of the term “charge of misconduct,” with particular focus on the meaning to be attached to the word “misconduct”;
 - (b) more precise direction as to the point in time that notice is to be given under section 13, taking into account the various difficulties that have been pointed out herein; and
 - (c) an exemption from the notice provisions of section 13 in the case of Inquiries that have been conducted as quasi-judicial proceedings in the presence of counsel for the affected parties and with the attendant procedural and evidentiary safeguards discussed herein, or where it can otherwise be inferred that the person against whom the allegations are made had notice of the charges.

PART NINE

**CONSOLIDATED
RECOMMENDATIONS**

CONSOLIDATED RECOMMENDATIONS

In the course of the hearings of this Commission of Inquiry, certain facts emerged from the evidence that, in the interests of aviation safety, I felt duty-bound to report in two interim reports. The recommendations that commence below are a consolidation of those that appear in my *Interim Report* of 1989, in my *Second Interim Report* of 1990, and in this my Final Report.

For ease of reference, the recommendations are numbered consecutively, beginning with those that appear in my *Interim Report* of 1989. They are preceded by the code "MCR," in accordance with the "short title" (Moshansky Commission) of the reports.

Interim Report, 1989

The Commission recommended that:

With respect to hot refuelling with passengers on board:

- MCR 1 / The Department of Transport prohibit the refuelling of an aircraft with an engine operating when passengers are on board, boarding, or deplaning.

With respect to wing contamination:

- MCR 2 The Department of Transport immediately develop and promulgate an Air Navigation Order applicable to all aircraft that would prohibit take-offs when any frost, snow, or ice is adhering to the lifting surfaces of the aircraft, and the Department of Transport provide guidelines to assist aviation personnel in conforming to the amended orders.

With respect to safety awareness:

- MCR 3 The Department of Transport forthwith develop and implement a mandatory and comprehensive education program for all aircrew engaged in commercial operations, including an integrated program for cockpit crew members and cabin crew

members, on the adverse effects of wing contamination on aircraft performance, with provision for knowledge verification; and

The Department of Transport similarly develop and implement a mandatory safety-awareness program for all other personnel involved in flight operations, including managers, dispatchers, and support personnel, on the adverse effects of wing contamination on aircraft performance.

With respect to last-minute check for wing contamination in conditions of adverse weather:

MCR 4 The Department of Transport immediately develop and implement, in consultation with the Canadian aviation industry, a system of mandatory inspection of an aircraft to be carried out by the pilot in command or his designate, or other qualified company personnel, to ensure that the aircraft's critical surfaces are clean before take-off.

In the event that a member of the cabin crew, based on his or her observation, reports a concern regarding wing contamination to the pilot in command, it shall be the duty of the pilot in command to check the wing condition either personally or through another member of the cockpit crew before take-off.

Second Interim Report, 1990

Aircraft Ground De-icing and Related Flight Safety Issues

The problems at Pearson International Airport can be resolved by long-term and short-term solutions. Over the long term, there is an obvious need for more concrete areas at the airport, including additional ramps, runways, and taxiways to relieve congestion. Permanent runway-end de-icing facilities should also be provided for the secondary de-icing of aircraft immediately before take-off in severe weather conditions. It can be expected that these long-term measures will take approximately three to five years to implement. The carriers, for their part, should upgrade their de-icing equipment and procedures and should use type II anti-icing fluids that meet AEA type II specifications to ensure that any departure delays are within the margin of safety. It is expected that these measures can be implemented within a much shorter time frame.

In the short term, several interim measures should be put in place immediately at Pearson International Airport. ATC gate-hold procedures

should be developed and implemented to ensure that departure delays are minimized. Temporary runway-end de-icing facilities for secondary de-icing of aircraft before take-off should be provided. These facilities would include the peripheral expansion of existing taxiways near the end of runways to support de-icing equipment and crews. In keeping with environmental concerns, any excess fluids at these locations should be collected and disposed of in an appropriate manner.

The Commission recommended that:

- MCR 5 Transport Canada should, on a priority basis and in co-operation with major Canadian air carriers, implement interim runway-end de-icing/anti-icing facilities at Pearson International Airport. The target should be to have the first of such facilities in place on an interim basis as early as possible in the 1990–91 icing season. Subsequent permanent installations should be designed and constructed to satisfy both safety and environmental concerns.
- MCR 6 Transport Canada should examine and, if feasible, implement air traffic control gate-hold procedures at Pearson International Airport as a means of reducing departure delays during conditions of freezing precipitation.
- MCR 7 In addition to the already announced feasibility studies for two new runways and supporting taxiways at Pearson International Airport, Transport Canada should investigate and, if feasible, proceed to implement an expansion of existing ramp space on the airport to reduce congestion and consequent departure delays. This undertaking should be given high priority.
- MCR 8 Transport Canada should strongly encourage and support the use by Canadian air carriers of type II anti-icing fluids that meet AEA specifications for turbo jet aircraft and, where applicable, for propeller-driven aircraft.
- MCR 9 Transport Canada should, in the interest of employee safety and in order to facilitate reliable inspection of aircraft surfaces after de-icing/anti-icing, ensure that adequate and sufficient exterior lighting exists in all gate and ramp areas where de-icing and anti-icing operations are conducted at

Pearson International Airport and at other major airports in Canada.

- MCR 10 Transport Canada should, on a priority basis, provide, where necessary, enforcement resources to ensure that the *clean aircraft* regulation is complied with, including runway-end spot checks of aircraft surfaces in adverse winter weather.
- MCR 11 Transport Canada should strongly encourage Canadian air carriers to form joint entities to provide all air carrier de-icing/anti-icing services at Pearson International Airport and at other major airports in Canada, and to have available, for use when necessary, equipment capable of applying both type I and type II fluids.
- MCR 12 Transport Canada should require that air carriers produce aircraft ground de-icing/anti-icing procedures and training standards for both flight and ground personnel. Implementation of such procedures and standards should be made a mandatory requirement of an air carrier's operating certificate.
- MCR 13 Transport Canada's Airports Authority Group should place on the staff of each of its major airports, individuals with substantial flight operations expertise. Such individuals should report directly to the airport manager on any issue related to operational safety. Furthermore, a mandatory reporting process should be put in place to ensure that aviation safety-related issues are promptly brought to the attention of the appropriate decision-making level of senior management and to ensure that such issues are addressed within a specified period of time.
- MCR 14 Transport Canada should examine, on a priority basis, Canadian airports served by air carriers to ascertain if the incompatibility between departure delays and de-icing/anti-icing fluid hold-over times, as identified at Toronto's Pearson International Airport, exists at other sites. Should such incompatibilities be found, Transport Canada should ensure that appropriate corrective measures are taken.
- MCR 15 Transport Canada and/or the air carriers should, in the interests of ramp employee safety and for environmental reasons, maintain suitable equipment and develop appro-

priate procedures for the clean-up and disposal of de-icing/anti-icing fluids in areas utilized by air carriers.

- MCR 16 Transport Canada should take an active and participatory role in the work currently underway within the international aviation community to advance aircraft ground de-icing/anti-icing technology. This should include involvement in the development of international standards, development of guidance material for remote and runway-end de-icing facilities, and development of more reliable methods of predicting de-icing/anti-icing fluid hold-over times.
- MCR 17 Transport Canada should strongly encourage Canadian air carriers to provide their flight crews with de-icing/anti-icing fluid hold-over time charts that are based on the most recent technological information. These charts should be used as guidelines.

Final Report

These recommendations are a consolidation of those that appear throughout the Final Report. Although they are grouped according to the chapter they follow, recommendations may relate to more than one issue and should be considered in the context of the complete Report.

Part Two Facts Surrounding the Crash of Flight 1363

Chapter 8 Dryden Area Response

It is recommended:

- MCR 18 That Transport Canada ensure that airport crash, fire-fighting, and rescue units carry out emergency response exercises as mandated in applicable Transport Canada documentation, including exercises in winter and in off-airport conditions.
- MCR 19 That Transport Canada ensure that all persons involved in crash, fire-fighting, and rescue (CFR) exercises, including CFR chiefs and on-site coordinators, fully understand and carry out their duties during such exercises, as defined in applicable Transport Canada documentation and as they would in an emergency.
- MCR 20 That Transport Canada ensure that airports subsidized by Transport Canada have in place at all times up-to-date crash, fire-fighting, and rescue airport emergency response plans and airport emergency procedures manuals approved by Transport Canada.
- MCR 21 That Transport Canada ensure that the necessary crash, fire-fighting, and rescue emergency response to aircraft crashes that occur within the critical rescue and fire-fighting access area (CRFAA) be clearly delineated in all relevant documentation, including airport emergency response plans and airport emergency procedures manuals.

- MCR 22 That Transport Canada ensure that, as part of the emergency planning process, all responding agencies designated in an airport emergency procedures manual equip themselves with radios capable of communication on a common channel.

Part Three Crash, Fire-fighting, and Rescue Services

Chapter 9 Dryden Municipal Airport Crash, Fire-fighting, and Rescue Services

It is recommended:

- MCR 23 That Transport Canada ensure that airport authorities at all Canadian airports, in conjunction with crash, fire-fighting, and rescue (CFR) unit personnel, determine the best and most practical ways to deal with emergencies within each airport boundary and critical rescue and fire-fighting access area (CRFAA), having regard to available CFR personnel and equipment and to the surrounding terrain.
- MCR 24 That Transport Canada ensure that all documents which describe or refer to the critical rescue and fire-fighting access area (CRFAA), be they Transport Canada documents or local airport authority documents, are informative, consistent, and unambiguous with regard to the CRFAA, and that such documents specifically define the responsibilities of a crash, fire-fighting, and rescue unit within the CRFAA both within the airport boundaries and/or beyond.
- MCR 25 That Transport Canada ensure, through the fire-fighter certification program, and other programs and agreements as necessary, that all crash, fire-fighting, and rescue fire-fighters, including the fire chiefs, are adequately trained.
- MCR 26 That Transport Canada proffer for enactment legislation that empowers Transport Canada to ensure that all crash, fire-fighting, and rescue (CFR) personnel, including those at non-Transport Canada-owned and non-Transport Canada-

operated airports, meet Transport Canada CFR training and operating standards.

- MCR 27 That Transport Canada encourage all communities where there is an airport with fire-fighting services to include in their mutual aid/emergency response plans specific instructions regarding the duties, responsibilities, and area of authority of each organization that is expected to respond to an aircraft emergency on and/or off airport property.
- MCR 28 That Transport Canada ensure that refuellers at Transport Canada-subsidized or operated airports are fully knowledgeable in and follow safe refuelling practices.
- MCR 29 That Transport Canada implement a policy of having airport crash, fire-fighting, and rescue units, after appropriate training, responsible for monitoring aircraft fuelling procedures and ensuring compliance with fuelling standards and procedures.
- MCR 30 That Transport Canada ensure that training programs for airport crash, fire-fighting, and rescue units include preparing fire-fighters for the realities of an air crash, so that they are not distracted from their primary responsibilities at a crash site.
- MCR 31 That whenever a crash, fire-fighting, and rescue (CFR) unit responds to an aircraft crash, Transport Canada, as part of its post-crash response, objectively review and analyse the actions of the CFR unit forthwith, in order that deficiencies in the CFR response can be corrected and useful information, on both the positive and negative aspects of the response, may be passed on to other CFR units.
- MCR 32 That Transport Canada ensure that local arrangements be made between airport managers and air carriers that will result in crash, fire-fighting, and rescue personnel being informed of the number of persons on board, fuel on board, and any hazardous cargo on board an aircraft in the shortest possible time following an incident or accident. These procedures should accommodate the possibility that the aircraft flight crew will not be able to provide this information.

Part Four Aircraft Investigation Process and Analysis

Chapter 10 Technical Investigation

Aircraft Crash Charts

Based on the evidence that there were no F-28 aircraft crash charts available at the crash, fire-fighting, and rescue (CFR) unit at Dryden on the day of the accident, and that the flight data and cockpit voice recorders were destroyed by fire, I had intended to make recommendations as to the availability of crash charts and their use in the training of CFR unit personnel. It appears, however, that, since the hearings of this Commission, Transport Canada has been instrumental in ensuring that all Transport Canada-owned and operated airports have aircraft crash charts readily available. These initiatives more than satisfy my concerns in relation to Transport Canada-owned and operated airports, and recommendations for such airports are, accordingly, not required. In relation to all airports in Canada that are not Transport Canada-owned or operated, I make the following recommendation:

- MCR 33** That Transport Canada, in cooperation with airport operators, ensure that all Canadian airports not owned or operated by Transport Canada, which service a scheduled air carrier operation, have appropriate crash charts made available to the same degree and extent as at airports owned and operated by Transport Canada.

Survivability of Flight Data Recorders and Cockpit Voice Recorders in Aircraft Crashes

The recorders in C-FONF were destroyed by fire and were of no use to the investigators of this crash. Because recorders capture essential parameters of aircraft information and performance, and are normally the source of the best investigative information, it is vitally important that their crash survivability be enhanced. I therefore make the following recommendations:

- MCR 34** That Transport Canada and the Transportation Safety Board of Canada, through national and international initiatives and committees, continue to press for the adoption of more rigorous survivability test requirements for aircraft flight data-recording systems.

- MCR 35 That Transport Canada and the Transportation Safety Board of Canada undertake a research program leading to the development of the most suitable deployable or non-deployable aircraft flight data-recording systems that can reasonably be expected to survive any crash and yield usable data.
- MCR 36 That Transport Canada and the Transportation Safety Board of Canada study, or cause to be studied, the location of aircraft flight data-recording systems in aircraft, with a view to assuring the survival of the recording systems in any crash.

Letter of Approval Requirement

It is not clear in the Transport Canada instructions whether the issuance of a letter of approval is a requirement. In the approval process of the maintenance control manual or any amendment thereto, in my view, the letter serves a purpose, and thus I make the following recommendation:

- MCR 37 That Transport Canada make mandatory the issuance of a letter of approval to an air carrier as an integral part of the approval process of the "maintenance control manual" or any amendment thereto.

Definition of "Essential Equipment"

Testimony given at this Commission's hearings revealed that there is not a definition of the term "essential equipment" that is readily usable or useful to pilots and technicians during normal aircraft operations. It is therefore recommended:

- MCR 38 That Transport Canada redefine in Air Navigation Order Series II, No. 20, the term "essential equipment," in order that it be unambiguous and easily understood by pilots and technicians who have to use or refer to the term.

Chapter 11 Aircraft Crash Survivability

It is recommended:

- MCR 39 That Transport Canada press for the adoption of standards for aircraft interiors that would prevent the rapid spread of fire and the emission of toxic fumes.
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Chapter 12 Fokker F-28, Mk1000, Aircraft Performance and Flight Dynamics

It is recommended:

- MCR 40 That Transport Canada ensure that all operations personnel involved in air carrier operations, including managers, operations officers, maintenance personnel, and pilots, be made fully aware of the nature and the danger of wing contamination on both jet- and propeller-driven aircraft.
- MCR 41 That Transport Canada ensure that all personnel involved in air carrier operations, including managers, operations officers, maintenance personnel, and pilots, have, and be able to demonstrate, a thorough understanding of all aspects of wing contamination, including its formation, removal, and prevention, and its effects on the aerodynamics of aircraft, with particular emphasis on the insidious nature of the "cold-soaking" phenomenon.
- MCR 42 That pilots be informed in writing by Transport Canada how the application of non-standard handling techniques, as described in the "Flight Dynamics" report prepared for this Commission and included in the Final Report as technical appendix 4; as described in the Fokker F-28 Flight Handbook; and as described in testimony by expert witnesses, may assist a pilot to deal with an abnormal or emergency situation discovered during takeoff. It is stressed that this Commission does not advocate the use of non-standard handling techniques to operate aircraft in adverse weather conditions as an alternative to the proper preparation of the aircraft for flight.

- MCR 43 That Transport Canada require that aircraft flight manuals and related aircraft operating manuals contain approved guidance material for supplementary operating procedures, including performance information for operating on wet and contaminated runways.
- MCR 44 That Transport Canada, in cooperation with aircraft manufacturers and operators, expedite the search for a technically accurate means of defining runway surface conditions and their effects on aircraft performance.
- MCR 45 That Transport Canada require air carriers to provide adequate training to flight crews with respect to the effects of contaminated runways on the performance of aircraft in the context of landings, takeoffs, and rejected takeoffs.
- MCR 46 That Transport Canada, in cooperation with aircraft manufacturers and operators, expedite the search for an equitable and practical means of requiring operators to adhere to balanced field criteria when operating on wet or contaminated runways.
- MCR 47 That Transport Canada, in cooperation with airport operators, expedite the search for more efficient methods of ensuring that runways are maintained free of contaminants that affect the takeoff performance of aircraft.
- MCR 48 That Transport Canada participate in and encourage research concerning devices that can allow pilots to assess the external state of the aircraft from within the flight deck. In addition to assisting pilots in assessing possible contamination of the aircraft, such devices would assist pilots in assessing any mechanical or technical problems on the exterior of the aircraft.

Part Five The Air Carrier – Air Ontario Inc.

Chapter 16 The F-28 Program: The Auxiliary Power Unit, the Minimum Equipment List, and the Dilemma Facing the Crew of Flight 1363

It is recommended:

- MCR 49 That Transport Canada proffer for enactment legislation which would require that approved minimum equipment lists be in place for all aircraft certified under United States Federal Aviation Regulation 25, predecessor regulations, or equivalent legislation, prior to the use of such aircraft in commercial service in Canada.
- MCR 50 That Transport Canada not issue an operating certificate or amendment to an operating certificate to an air carrier operating aircraft certified under United States Federal Aviation Regulation 25, predecessor regulations, or equivalent legislation until required and approved minimum equipment lists are in place.
- MCR 51 That Transport Canada ensure that the repair of an unserviceable aircraft auxiliary power unit be deferred only with an operational restriction requiring approved engine ground-start facilities to be available at all airports into which that commercial aircraft is expected to operate. This operational restriction should be included in the aircraft minimum equipment list.
- MCR 52 That Transport Canada issue to all pilots a warning pointing out the dangers inherent in pulling circuit-breakers on board an aircraft in order to silence an alarm that may in fact be giving a valid warning.
- MCR 53 That Transport Canada require that air carriers have in place appropriate policies and directives to ensure that flight crews,

at the time they receive an operational flight plan, are informed of any aircraft defects that have been deferred to a minimum equipment list.

- MCR 54** That Transport Canada require all air carriers that operate aircraft having minimum equipment lists (MELs) to provide approved training to all pilots, maintenance personnel, and dispatchers on the proper use of an MEL.

Chapter 17 The F-28 Program: Lack of Ground-Start Facilities at Dryden

It is recommended:

- MCR 55** That Transport Canada ensure that air carriers have operational policies that require the availability of appropriate ground-support facilities at individual airports where the air carrier intends to operate.
- MCR 56** That Transport Canada ensure that the operational policies referred to in Recommendation MCR 55 above be contained in the air carrier's operations manuals, such as its flight operations manual and its route manual, and/or the individual aircraft minimum equipment list.
- MCR 57** That Transport Canada ensure that, when it is reviewing an air carrier application for an operating certificate or an amendment to an operating certificate, there be a scrutiny of the air carrier's intended aircraft support facilities. Transport Canada then should satisfy itself that operational policies contained in the air carrier's operations manuals adequately accommodate the air carrier's identified and existing aircraft support facilities. No operating certificate or amendment to an operating certificate should be issued unless Transport Canada is so satisfied.

Chapter 18 The F-28 Program: Spare Parts

It is recommended:

- MCR 58 That Transport Canada direct its airworthiness personnel to determine themselves whether an air carrier has adequate spare parts for the proper maintenance of aircraft. Under no circumstances should this decision, in effect, be delegated to any person employed by the applicant air carrier.
- MCR 59 That Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, Part II, section 12(2), that assists Transport Canada airworthiness personnel to determine whether sufficient spare parts exist. Alternatively, an approved written departmental policy should be promulgated to assist airworthiness personnel to make this determination.
- MCR 60 That Transport Canada under no circumstances issue an operating certificate or an amendment to an operating certificate until it is satisfied that all spare parts requirements established by Transport Canada are fulfilled.

Chapter 19 The F-28 Program: Flight Operations Manuals

It is recommended:

- MCR 61 That Transport Canada approve a complete copy of the air carrier's operations manual prior to the granting of an operating certificate or an amendment to an operating certificate, and that it approve all amendments and insertions made to that manual.
- MCR 62 That Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, requiring Transport Canada to approve one aircraft operating manual for each type of aircraft operated by the air carrier. It is further recommended that such approval be required prior to the granting of an operating certificate or an amendment to an

operating certificate by Transport Canada to the air carrier to allow the commercial use of that aircraft type by the air carrier.

- MCR 63 That Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, requiring each air carrier to provide to Transport Canada an air carrier cabin attendant manual for review and approval, either as part of the flight operations manual or as a separate manual.
- MCR 64 That Transport Canada proffer for enactment an amendment to Air Navigation Order Series VII, No. 2, deleting the existing tests contained in sections 5, 6, and 33 and replacing them with tests containing the wording "high degree of safety" and "highest degree of safety." Such wording is similar to wording contained in equivalent United States Federal Aviation Regulation legislation dealing with standards and procedures for air carriers using large aircraft.
- MCR 65 That Transport Canada proffer for enactment legislation requiring an air carrier to submit its operations manual as defined in Air Navigation Order Series VII, No. 2, to Transport Canada and have it approved prior to the issuance by Transport Canada of an operating certificate or any amendment thereto.
- MCR 66 That Transport Canada ensure that air carriers follow and comply with those sections of the operations manuals required by Air Navigation Order Series VII, No. 2.

Chapter 20 The F-28 Program: Flight Operations Training

It is recommended:

- MCR 67 That Transport Canada ensure that a systematic and comprehensive discussion of cold soaking be inserted in air carriers' flight operations manuals and/or aircraft operating manuals and in Transport Canada publications such as the Aeronautical Information Publication, to make all pilots and aviation operational personnel aware of the insidious nature

of the cold-soaking phenomenon and the various factors that may cause contamination to adhere to aircraft lifting surfaces.

- MCR 68 That Transport Canada ensure that all air carrier pilot flight training be conducted in aircraft flight simulators to the maximum extent possible.
- MCR 69 That Transport Canada ensure that an air carrier, if it does not have pilots with the requisite and necessary flight experience on the aircraft when it introduces a new aircraft type, provide sufficient non-revenue flying time for its pilots to enable them to gain the requisite experience.
- MCR 70 That Transport Canada encourage air carriers lacking pilots with sufficient experience on a new aircraft type to provide highly experienced pilots from outside the air carrier to assist in training the air carrier's pilots and to fly with them until they have gained an adequate level of flight experience on the new aircraft type.
- MCR 71 That Transport Canada proffer for enactment legislation with respect to flight crew pairing, requiring that one of the flight crew members, either the pilot-in-command or the first officer, have substantial flight experience on the aircraft type.
- MCR 72 That Transport Canada routinely inspect the activities of aircraft fuellers and ground-handling personnel, to ensure that they are properly performing their duties and to ensure that these personnel have received adequate training.
- MCR 73 That Transport Canada ensure that all ground-handling personnel, whether employed by the air carrier or by a contract agent, receive ground-handling training on all aircraft types that they will be required to handle. If personnel are required to refuel aircraft, they should also have knowledge of proper fuelling procedures.
- MCR 74 That Transport Canada proffer for enactment regulations setting the training and competency requirements for cabin attendants.
- MCR 75 That Transport Canada monitor and periodically audit the cabin attendant training program of all air carriers to ensure that such training meets the standards set.

Chapter 21 The F-28 Program: Operational Practices – Hot Refuelling and Aircraft Ground De-icing

It is recommended:

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| MCR | 76 | That Transport Canada ensure that the flight operations manuals of all air carriers specify that hot refuelling is an abnormal and potentially dangerous procedure and that they outline in detail the appropriate procedures to be followed in order to conduct hot refuelling safely. |
| MCR | 77 | That Transport Canada, during the process of approval of air carrier manuals, ensure that the provisions of the proposed manuals are consistent and, specifically, that they coordinate the duties of the cabin crew with those of the flight crew concerning hot-refuelling procedures, with appropriate cross-referencing between the manuals. |
| MCR | 78 | That Transport Canada ensure that all aircraft fuellers are adequately trained to standards set by Transport Canada. |
| MCR | 79 | That Transport Canada ensure the adequate monitoring of aircraft fuelling procedures at Canadian airports. |
| MCR | 80 | That Transport Canada encourage air carriers to adjust their operational procedures and policies, where technically feasible, to permit the de-icing of an aircraft with a main engine running. |
| MCR | 81 | That Transport Canada ensure that the intention of the "clean-wing" concept, as embodied in Recommendations MCR 2 and 3 above and in recent amendments to the Air Regulations (SOR/90-757) and the Air Navigation Orders (SOR/90-758, and SOR/90-759), be incorporated into and given effect in the appropriate operational manuals of Canadian air carriers. |
| MCR | 82 | That Transport Canada ensure, during its normal certification and inspection of Canadian air carriers, that the air carriers have well-organized and effective systems in place for the |

coordinated distribution to all pilots and operational personnel of comprehensive operational information – including, but not limited to, information regarding aircraft ground de-icing procedures.

- MCR 83** That Transport Canada give serious consideration to appointing an appropriately qualified person as a national resource specialist dedicated to all matters pertaining to aircraft surface contamination and the ground de-icing and anti-icing of aircraft in Canada, in the broadest sense, based upon a similar position in the Federal Aviation Administration of the United States and with similar objectives and responsibilities.

Chapter 22 The F-28 Program: Flight Attendant Shoulder Harness

It is recommended:

- MCR 84** That Transport Canada immediately press ahead with appropriate amendments to Air Navigation Order Series II, No. 2, that would require the retrofit of shoulder harnesses and other safety-enhancing features for flight attendant seats on older aircraft types such as the F-28 aircraft.
- MCR 85** That Transport Canada assess and amend, as necessary, the procedures required to enact aviation safety-related legislation so as to avoid the bureaucratic process that has delayed the enactment of flight attendant shoulder harness and other important aviation safety-related legislation for the 12-year period since similar legislation was enacted in the United States.
- MCR 86** That Transport Canada ensure that individuals from aviation industry positions are not placed on Transport Canada hiring or selection committees where there is any appearance of those individuals having a conflict of interest between their industry positions and their positions on the selection committee.

Chapter 23 Operational Control

It is recommended:

- MCR 87 That Transport Canada re-examine its regulatory requirements pertaining to air carrier operational control and flight watch systems, and that it consider putting into place the four-tiered scheme for such systems discussed in chapter 23, *Operational Control*, of my Final Report.
- MCR 88 That Transport Canada proffer for enactment legislation requiring the licensing of flight dispatchers as a prerequisite to their acting as flight dispatchers and training to standards set by Transport Canada, including the passing of appropriate Transport Canada licensing examinations. I commend for Transport Canada's consideration the Federal Aviation Administration licensing regime for flight operational officers (flight dispatchers) in the United States.
- MCR 89 That pending implementation of Recommendation MCR 88 above, Transport Canada direct its air carrier inspectors to be diligent in ensuring that flight dispatchers who exercise any operational control over flights meet the minimum training requirements of Air Navigation Order Series VII, No. 2.
- MCR 90 That Transport Canada proffer for enactment amendments to Air Navigation Order Series VII, No. 2, that spell out minimum acceptable requirements for an operational flight plan (flight release).
- MCR 91 That Transport Canada direct air carrier inspectors to be diligent during in-flight and base inspections in monitoring the accuracy of operational flight releases.
- MCR 92 That Transport Canada, when approving air carrier manuals, ensure that flight dispatcher training qualifications set out in a flight dispatcher training manual are no less comprehensive than those requirements set out in the Air Navigation Orders in all cases where such dispatchers may exercise any operational control over flights.
- MCR 93 That Transport Canada initiate a continuing program for the monitoring, inspection, and audit of air carrier flight

dispatchers and flight dispatch and flight watch systems, with provision for spot checks and no-notice audits.

- MCR 94 That Transport Canada introduce appropriate amendments to the Air Navigation Order Series VII, No. 2, Part III, so as to describe clearly and definitively where system operations control begins and terminates and where operational control begins and terminates.
- MCR 95 That Transport Canada require that air carriers provide a system, automated or otherwise, for alerting dispatchers to significant changes in the weather, actual or forecast, at stations significant to flights for which a flight watch is provided.
- MCR 96 That Transport Canada require that flight-planning data and procedures used by air carriers for pre-flight planning be accurate and sufficient to provide fuel reserves as stated in Air Navigation Order Series VII, No. 2, and to ensure that aircraft will be operated within the certificated weight restrictions.
- MCR 97 That Transport Canada ensure that any flight watch system required under Air Navigation Order Series VII, No. 2, and approved by Transport Canada, provide for direct pilot-to-dispatch communications from the flight deck, where the necessary communications links exist.
- MCR 98 That, if a pilot self-dispatch system is to be approved, both Transport Canada and the air carrier ensure that the duties and responsibilities of pilots and dispatchers are clearly and comprehensively covered in the Flight Operations Manual (FOM). It should be made clear in the FOM that no operational decisions are to be made without the captain's agreement.
- MCR 99 That Transport Canada require all air carriers to have in place a system that requires ground-handling agents to inform dispatch and/or the captain of any significant change to aircraft passenger or freight loads immediately upon such a change becoming known to the ground-handling agent.

Chapter 24 Flight Safety

It is recommended:

- MCR 100** That Transport Canada proffer for enactment legislation to amend Air Navigation Order Series VII, No. 2, section 5, to include the position of flight safety officer as a required air carrier managerial position.
- MCR 101** That Transport Canada proffer for enactment legislation to amend Air Navigation Order Series VII, No. 2, section 5, to require the appointment by an air carrier of a person to the position of flight safety officer for the carrier, the qualifications of such person and the description of the duties and responsibilities of such position to be determined by Transport Canada after consultation with the air carrier industry, and to provide that the flight safety officer shall have direct access on a continuing basis to the chief executive officer of the air carrier in flight safety-related matters.
- MCR 102** That Transport Canada initiate a program of consultation with Canadian air carriers and the Transportation Safety Board of Canada with a view to having air carriers institute, staff, and operate, on a continuing basis, an effective flight safety program that is based upon the "Flight Safety Functions," identified in the International Air Transport Association Technical Policy Manual, OPS Amendment No. 37, July 1989, referred to in chapter 24 of my Final Report, Flight Safety.
- MCR 103** That Transport Canada institute a program for the monitoring of the flight safety programs of Canadian air carriers, with a view to ensuring that each air carrier has in place an effective flight safety program that is appropriate for the size and scope of the carrier's operations.

Chapter 25 Management Performance

It is recommended:

- MCR 104** That Transport Canada ensure that Air Navigation Order Series VII, No. 2, section 5, be amended to provide a clear statement of the duties, responsibilities, and qualifications for all air carrier management positions set out therein.
- MCR 105** That Transport Canada develop standard criteria for the qualifications of all air carrier management positions set out in Air Navigation Order Series VII, No. 2, section 5. Such criteria should include consideration of the following attributes of the respective management candidates:
- aviation and management experience;
 - flying experience;
 - professional licences, such as aircraft maintenance engineer or airline transport rating;
 - incident and occurrence record;
 - knowledge of the *Aeronautics Act*, Air Regulations, and Air Navigation Orders, including air carrier certification requirements and procedures; and
 - knowledge of the appropriate air carrier manuals necessary for proper performance of duties and responsibilities.
- MCR 106** That Transport Canada ensure that, once standard criteria referred to in MCR 105 are established and published, all air carrier management candidate approvals be subject to such criteria being fully satisfied.
- MCR 107** That Transport Canada ensure the ongoing and adequate surveillance and monitoring of new aircraft implementation programs by Canadian air carriers.
- MCR 108** That Transport Canada proffer for enactment legislation imposing upon an air carrier concurrent responsibility with the pilot-in-command for the safe and proper crewing, dispatch, and conduct of a flight over which the air carrier exercises any degree of operational control. (The adoption of the United States Federal Aviation Regulation 121 would address this area of concern.)

- MCR 109** That Transport Canada ensure that the investigation of any violation of the Air Regulations or Air Navigation Orders committed by an air carrier pilot or an aircraft maintenance engineer include an examination of the air carrier's contribution to the circumstances or environment that may have led to such violation. Where such an investigation reveals that the air carrier's contribution was significant, appropriate and parallel enforcement action should be taken against the air carrier as well as against the individual.

Part Six Transport Canada

Chapter 30 The Effects of Deregulation and Downsizing on Aviation Safety

It is recommended:

- MCR 110** That the Aviation Regulation Directorate focus adequate resources on surveillance and monitoring of the air carrier industry, with emphasis on in-flight inspections and unannounced spot checks.
- MCR 111** That Transport Canada establish a policy that identifies surveillance of existing air carriers as a non-discretionary task.
- MCR 112** That Transport Canada establish a contingency policy in order to meet unusual resource demands without jeopardizing adequate staffing of inspection and surveillance functions.
- MCR 113** That Transport Canada pursue extension of the delegation of authority to industry in accordance with the recommendations of Transport Canada's Management Consultant Branch studies completed in 1990 on this subject. Where additional delegation of authority to industry can be achieved safely, such delegation should be authorized in order to allow more effective use of Transport Canada inspectors.
- MCR 114** That Transport Canada establish a policy to ensure that required support staff will be provided so that inspector staff will not be misdirected from their operational safety-oriented

surveillance duties in order to perform tasks more appropriately conducted by support staff.

- MCR 115** That Transport Canada establish an air carrier inspector training policy to be put into force without further delay, and that the policy ensure the following:
- (a) A clear statement of the requisite competencies for each inspector position in the Airworthiness and Flight Standards directorates of Transport Canada.
 - (b) A statement of the training courses required to be completed successfully by inspectors before they are delegated authority and before their probationary periods end.
 - (c) Successful completion of training to be required before air carrier inspectors are delegated their authority credentials.
 - (d) Establishment of a recurrent training program for each discipline of inspection to ensure continued competence.

- MCR 116** That Transport Canada improve staffing and recruiting programs to enable aviation regulation requirements to be filled on a high-priority basis. The capability to fast-track such staffing requirements should be achieved as soon as reasonably possible.

- MCR 117** That Transport Canada, in consultation with the air carriers, work out an arrangement to accommodate the requirement of no-notice in-flight cabin safety inspections and surveillance on charter flights.

Chapter 31 Aviation Regulation: Resourcing Process

It is recommended:

- MCR 118** That Transport Canada, as an integral part of any future policy development process, ensure that thorough impact studies be carried out by experienced analysts, knowledgeable in the subject matter, as a prerequisite to government acceptance and implementation of policies that could have a bearing on aviation safety.

- MCR 119 That, where a potentially adverse effect on safety is identified, appropriate measures be taken by the government to preclude the effect before the policy is implemented.
- MCR 120 That all senior Transport Canada Aviation Group managers have at their disposal knowledge of the current demands being imposed on branches of the department for which they have responsibility.
- MCR 121 That Transport Canada encourage all Aviation Group managers, at any level, to communicate to their superiors any significant aviation safety concern that has come to their attention and that could affect the Canadian aviation industry and public.
- MCR 122 That Transport Canada put in place a policy directive that if resource levels are insufficient to support a regulatory or other program having a direct bearing on aviation safety, the resource shortfall and its impact be communicated, without delay, to successive higher levels of Transport Canada management until the problem is resolved or until it is communicated to the minister of transport.
- MCR 123 That an air carrier activity reporting system providing a current and reliable picture of the industry be developed and utilized by Transport Canada to determine program resource needs, levels, and direction.
- MCR 124 That the process of resource allocation, including staffing standards, be re-examined by Transport Canada with the following objectives:
- (a) To establish a staffing standard based on realistic and measurable task performance and frequencies and accepted standards of time required for such tasks.
 - (b) To reduce the challenging levels from the present seven or more to a lower, more realistic level.
 - (c) To establish a resource contingency factor for aviation regulation that can, at the discretion of senior management of Transport Canada, be called upon to provide additional resources to meet exceptional safety-related circumstances.

- MCR 125** That Transport Canada examine the role of the Resource Management Board, formerly the Program Control Board, with a view to attaining the following goals:
- (a) To ensure that the deputy minister of transport will be informed of all aviation safety implications of any resource reductions or denials recommended by the Resource Management Board.
 - (b) To ensure that within the Resource Management Board and its secretariat there is an individual with aviation operational expertise who is cognizant of safety implications in resource reduction programs.
 - (c) To ensure that members of the Resource Management Board understand the implications of personnel reductions below the minimum level prescribed by accepted staffing standards.
 - (d) To ensure that the deputy minister of transport be informed of each instance in which the Resource Management Board or its secretariat returns plans to Transport Canada group heads asking for further justification of resource requirements for aviation safety-related items.
- MCR 126** That Transport Canada's Aviation Regulation Directorate develop a system that focuses resources on the areas of highest risk.
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Chapter 33 Audit of Air Ontario Inc., 1988

It is recommended:

- MCR 127** That Transport Canada review and revise its aviation audit policy, under the direction and approval of the assistant deputy minister, aviation.
- MCR 128** That Transport Canada ensure that the rationale for and the importance of the audit program be clearly enunciated to all participating departmental staff and to the aviation industry.
- MCR 129** That Transport Canada ensure that the frequency of audits be based upon a formula that takes into consideration all significant factors, including safety and conformance records, changes in type of operations, mergers, introduction of new equipment, and changes in key personnel.

- MCR 130** That Transport Canada policy confirm that joint air carrier airworthiness and operations audits are the accepted norm, particularly for large companies; however, other types of audits should be identified and flexibility provided to facilitate no-notice mini-audits or inspections, split airworthiness and operations audits where warranted, and audits of specific areas of urgent concern arising from safety issues that are identified from time to time.
- MCR 131** That Transport Canada ensure the availability of qualified managers to manage and coordinate the audit programs.
- MCR 132** That Transport Canada ensure the availability of adequate and qualified personnel to support the audit program.
- MCR 133** That Transport Canada ensure that minimum training and competency requirements be established for specific positions in the audit process.
- MCR 134** That Transport Canada ensure that personnel appointed to an audit have a direct reporting relationship to the audit manager from commencement until completion of the audit and the approval of the final report for that audit.
- MCR 135** That Transport Canada reinforce existing policy that requires audit managers to be readily available to audit staff during the conduct of an audit.
- MCR 136** That Transport Canada policy manuals provide that an air carrier document review process, including a review of prior audits, be completed prior to the commencement of an audit.
- MCR 137** That Transport Canada ensure that time limitations be clearly specified and adhered to within which completion and delivery of audit reports are to be achieved.
- MCR 138** That Transport Canada ensure that procedures for immediate response to critical safety issues identified during an audit be instituted and included in the appropriate Transport Canada manuals, and that such procedures be communicated to the Canadian aviation industry.

- MCR 139** That Transport Canada ensure that trend analyses be produced from the results of audits and used in the formulation of decisions regarding the type, subject, and frequency of audits.

Chapter 34 Operating Rules and Legislation

It is recommended:

- MCR 140** That Transport Canada ensure that managers and inspectors responsible for the application of operating rules are consulted on proposed changes to such rules.
- MCR 141** That if the proposed draft operating rules currently being developed by Transport Canada do not fully address and satisfy the concerns identified by this Inquiry and expressed herein, then the entire matter of air carrier operating rules be reconsidered by Transport Canada with a view to adopting the United States Federal Aviation Regulation operating rules applying to air carriers for the Canadian regulatory scheme, amended or supplemented as necessary to accommodate Canadian conditions and purposes, on the highest possible priority basis.
- MCR 142** That in the event that the United States Federal Aviation Regulation (FAR) operating rules are adopted by Transport Canada for a required Canadian regulatory scheme, Transport Canada retain an expert in the application of the FARs to assist in their transition into the Canadian regulatory regime.
- MCR 143** That in the event of adoption of the United States Federal Aviation Regulation operating rules for a revised Canadian regulatory scheme, all the recommendations contained in this Final Report and in my Interim Reports proposing amendments or changes to existing Air Navigation Orders and Regulations be incorporated accordingly in order to give full meaning and effect to the subject matter under consideration.
- MCR 144** That Transport Canada monitor the efforts of the United States Federal Aviation Administration and the European Joint Aviation Authorities to achieve greater commonality in

aircraft design and certification requirements and in operating regulations, with a view to achieving harmonization of Canadian airworthiness and operating rules with the changing international aviation environment.

- MCR 145** That Transport Canada adopt the recommendations contained in sections 5.2 and 5.3 of the May 1990 evaluation of Aviation Regulation and Safety Programs, regarding priority setting for regulatory developments and the rule-making process.
- MCR 146** That a senior member of the Privy Council staff be included in the proposed senior departmental review committee for priority setting.

Chapter 35 Company Check Pilot

It is recommended:

- MCR 147** That Transport Canada pursue a program that would lead to further delegation of authority to company check pilots with air carriers that have demonstrated an exemplary safety record and have in place mature programs for training and checking pilots. To such carriers, delegation of authority with respect to initial pilot proficiency checks and pilot upgrades should be considered as well.
- MCR 148** That Transport Canada provide a comprehensive monitoring program of both designated company check pilots and a representative cross-section of each company's pilots to ensure that standards are being properly applied and maintained.
- MCR 149** That Transport Canada conduct, and reserve the right to conduct, pilot proficiency spot checks on all air carrier pilots, including designated company check pilots, as it sees fit and without notice.
- MCR 150** That Transport Canada conduct initial pilot proficiency checks and line checks with every air carrier in cases where a new aircraft type is being introduced, to ensure that the

required standards are met in that air carrier's operation of the new aircraft type.

- MCR 151** That Transport Canada ensure that all pilot proficiency checks on aircraft over 12,500 pounds and on all turbojet aircraft be conducted only by air carrier inspectors or company check pilots holding a current rating for the specific aircraft type on which the check is being conducted.
- MCR 152** That Transport Canada ensure that pilot proficiency checks on non-turbojet aircraft and on aircraft under 12,500 pounds be conducted only by air carrier inspectors or company check pilots who are type-rated on that aircraft type or on a generically similar aircraft.
- MCR 153** That Transport Canada develop a clear and unambiguous definition of "generically similar aircraft" to be placed in all applicable regulations and supporting manuals.
- MCR 154** That Transport Canada, on a priority basis, rewrite the conflict of interest section of its Air Carrier Check Pilot Manual so as to include the following objectives:
- (a) to provide a clear and unambiguous definition of what is meant by the term "conflict of interest" as it relates to company check pilots;
 - (b) to specify those areas in which a conflict of interest can arise, in addition to the area of financial interest.
- MCR 155** That Transport Canada provide explicit guidelines to its air carrier inspectors on the subject of conflict of interest for use in evaluating individual candidates for the position of company check pilot.
- MCR 156** That Transport Canada conduct an evaluation of potential conflict of interest with respect to each company check pilot candidate, and that a written record be kept of each such evaluation.

Chapter 36 Contracting Out, Waivers, and Spot Checks

It is recommended:

- MCR 157** That Transport Canada provide appropriate regulations governing the practice whereby air carriers enter into contracts with other companies or agencies for the provision of facilities or services required under the terms of the air carrier's operating certificate.
- MCR 158** That Transport Canada inspectors be provided clear and direct guidance governing their aviation-regulation responsibilities for approval of arrangements and facilities to be contracted out to other companies or agencies by Canadian air carriers.
- MCR 159** That Transport Canada set out a clear and unequivocal policy for senior managers specifying the basis upon which a waiver application is to be considered, ensuring that all safety implications are fully considered and satisfied before such waiver is granted.
- MCR 160** That Transport Canada take steps to increase substantially the number of no-notice inspections of air carriers, with particular emphasis on safety-sensitive or high-risk areas.

Chapter 37 Safety Management and the Transport Canada Organization

It is recommended:

- MCR 161** That Transport Canada proffer for enactment an amendment to the *Aeronautics Act* to delineate clearly the minister's responsibility for aviation safety. Such amendment should emphasize the minister's responsibility to ensure that the department is organized in a manner to keep the minister accurately informed of the ability of Transport Canada to deliver its mandated aviation safety programs effectively.

- MCR 162** That Transport Canada be organized in a manner to provide the managerial structure necessary to keep the minister and deputy minister fully and accurately informed of all matters having an impact on aviation safety, and to ensure that appropriate and timely action is taken to address aviation safety concerns.
- MCR 163** That Transport Canada state clearly the goals that aviation safety-related programs are expected to achieve, and that it identify the extent of inspection, surveillance, and enforcement activities that must be conducted within a given time frame. Such program goals should be designed in consultation with the Aviation Group's operationally and technically qualified staff.
- MCR 164** That Transport Canada create a single position in each region (e.g., a director-general) responsible and accountable for the delivery of the aviation programs assigned to the present Airports Authority Group and the Aviation Group. This position should report directly to a senior administrator or assistant deputy minister at headquarters, who is responsible for the overall delivery of such aviation programs on a national basis.
- MCR 165** That the regional directors-general (proposed in MCR 164 above) be authorized to manage their resources in a responsible and flexible manner. Such authority should be accompanied by firm insistence on accountability and a monitoring activity that will ensure responsible management.
- MCR 166** That Transport Canada create the position of a headquarters' operational aviation safety officer with an appropriate support staff. This aviation safety officer should report directly to the most senior aviation position in the department and should be responsible for auditing the safety performance of both the Airports Authority Group and the Aviation Group.
- MCR 167** That Transport Canada actively participate in the research and development necessary to establish safety effectiveness measurement systems that will lead to the most efficient use of resources in assuring safety. Cooperation with the United States Federal Aviation Administration and other international groups should be encouraged and resourced to obtain

the maximum and most expedient benefits from such programs.

- MCR 168** That Transport Canada aviation safety committees, with access directly to the headquarters' operational aviation safety officer, be established in regions and headquarters.
- MCR 169** That Transport Canada establish a mandatory education program to ensure that senior managers and officials of the department who are responsible for or associated with aviation programs are aware of the basis for and requirement to support policies that affect aviation safety.

Part Seven Human Factors

Chapter 38 Crew Information

It is recommended:

- MCR 170** That Transport Canada address the anomaly existing in Air Navigation Order Series VII, No. 2, with respect to the lack of maximum flight times and maximum flight duty times prescribed for cabin crew members.

Chapter 39 Crew Coordination and the Communication of Safety Concerns by Passengers

It is recommended:

- MCR 171** That Transport Canada implement regulations requiring air carriers to provide approved crew resource management training and standard operating procedures for all Canadian air carrier flight crews and cabin crews. This training should be designed to coordinate the flight activities and information exchange of the entire air crew team, including the following particulars:
- (a) As part of such crew resource management training, joint training should be carried out involving all captains

and in-charge cabin crew members in order that each fully understand the duties and responsibilities of the other.

- (b) All cabin crew members should be given sufficient training to enable them to recognize potentially unsafe situations both in the cabin and outside the aircraft. If it is necessary to prioritize such training, it should first be provided to all in-charge cabin attendants.
- (c) As part of normal pre-flight announcements over the aircraft public address system, passengers should be advised that they may draw any concerns to the attention of the cabin crew members.
- (d) All cabin crew members should be trained and instructed to communicate all on-board safety concerns they may have or that may be communicated to them by any passenger to the captain through the in-charge cabin crew member, unless time or other circumstances do not permit following this chain of command.
- (e) All in-charge cabin crew members, after appropriate training, should be encouraged in adverse winter weather conditions to monitor the condition of the surface of the aircraft wings as part of the pre-takeoff cabin routine, in order to check for contamination, as a supplement to the captain's primary responsibility in that regard.
- (f) Pilots should be made aware that concerns raised by cabin crew members should be taken seriously and investigated, where appropriate.
- (g) Pilots should be instructed that when travelling as passengers on board an aircraft they should never assume that the operating crew is aware of any situation that they themselves perceive to be a safety concern. Such pilot passengers should be encouraged to raise such concerns with a cabin crew member and request that the information be given to the captain.

MCR 172

That, in order to dispel any possible notion of "professional courtesy" or "respect" precluding the communication of any dangerous situation, specifically addressing the case of off-duty airline pilots, all Canadian air carriers and the Canadian Air Line Pilots Association provide to each of their pilots a clear statement disavowing any notion that professional courtesy or respect precludes an off-duty airline pilot on

board an aircraft as a passenger from drawing a perceived safety concern to the attention of the captain. The statement should indicate that, while it is not mandatory for them to do so, it is appropriate for off-duty pilots who are on board an aircraft as passengers to communicate to the captain, through the intervention of a cabin crew member, any safety-related concerns perceived on board the aircraft.

MCR 173 That the captain of an aircraft operating in adverse winter weather conditions be required formally to advise the in-charge cabin crew member, prior to departure from the gate, whether ground de-icing of the aircraft is to take place and, in order to eliminate potential apprehension on the part of passengers, that they be advised accordingly on the public address system of the aircraft.

MCR 174 That Transport Canada implement a regulation requiring that, at any time prior to commencement of the takeoff roll, in the absence of prior advice by the captain that ground de-icing of the aircraft in adverse winter weather conditions is to be conducted, the in-charge cabin crew member be required to report to the captain his or her own concerns, or any concerns conveyed to him or to her by any cabin crew member or any passenger on board the aircraft, relating to wing contamination.

Chapter 40 Human Performance: A System Analysis

The Human Performance chapter of this Report is, in many ways, a synthesis of all the issues that the crew faced on March 10, 1989, and recommendations on such issues have already been set out elsewhere. It is not my intent to repeat these recommendations in detail in this chapter, but, in the interests of continuity, a synopsis of the principal recommendations already addressed and relevant to Human Performance includes:

- A renewed air carrier certification and inspection program incorporating improved safety regulations, adequate resources, and properly qualified and trained personnel be implemented by Transport Canada on a priority basis.
- Formal training of all air carrier crew members in crew resource management be made mandatory by regulation.

- Crew-oriented training and evaluation be actively pursued jointly by Canadian air carriers and Transport Canada as a more effective means of training and evaluating air carrier flight crews.
- The appointment of an air carrier flight safety officer, approved by Transport Canada, and the establishment of an approved flight safety program by all Canadian air carriers be made a regulatory requirement.
- A systematic and comprehensive discussion regarding cold soaking, based on research such as was conducted for and on behalf of this Commission of Inquiry, be inserted in air carriers' flight operations manuals and/or aircraft operating manuals and in government publications such as the Aeronautical Information Publication in order to make all pilots and aviation operational personnel aware of the various factors that may cause contamination to adhere to lifting surfaces.

Recommendations not previously addressed and specific to this chapter are as follows:

MCR 175 That the Transportation Safety Board of Canada further develop its investigation procedures into human factors aspects of aviation accidents to include a comprehensive section addressing the role of air carrier management in the area of flight safety management; and that the board encourage examination of management failures in a causal sense as part of its accident investigation procedures.

MCR 176 In conjunction with MRC 175 above, that the Transportation Safety Board of Canada actively pursue the amendment of appropriate International Civil Aviation Organization documents to address in a similar manner the role of air carrier management in the area of flight safety management.

Part Eight Legal and Other Issues before the Commission

Chapter 41 The Aviation Accident Investigation Process in Canada

It is recommended:

- MCR 177 That the *Canadian Transportation Accident Investigation and Safety Board Act* be amended and regulations be passed to provide that, at any major aircraft accident investigation, parties having a direct interest in the investigation have the right to nominate, in consultation with the investigator in charge, individuals with specific expertise from among their ranks to be involved in the investigation as participants (as opposed to observers) on specific investigation team groups, such as operations, human factors, records, systems, engines, or site survey.
- The terms and conditions of such participant involvement should be determined by the Transportation Safety Board of Canada and ought to include provisions placing participants under the authority of and responsible to the investigator in charge, as well as provisions to ensure the absolute confidentiality of all information and documentation gathered relating to the investigation.
- MCR 178 That sections 28, 29, and 30 of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be amended to provide that witness statements, on-board recordings, and communications records referred to in those sections be made available on a confidential basis to those individuals who have been granted full participant status as representatives of parties having a direct interest in the accident investigation; and that all other provisions of sections 28, 29, and 30 of the *CTAISB Act* be amended accordingly in order to give full meaning and effect to the recommended amendments.
- MCR 179 That section 24(2) of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be repealed. The Transportation Safety Board of Canada, in order to preserve

its independence, should not be required to send a copy of any draft report on its findings and safety deficiencies that it has identified to each minister, or to any other person with a direct interest in the findings of the board, to provide them with an opportunity to make representations to the board with respect to the draft report, before the final report is prepared.

The other provisions of section 24 of the *CTAISB Act* should be amended accordingly in order to give full meaning and effect to the recommended repeal of section 24(2).

- MCR 180 That a section be added to the *Canadian Transportation Accident Investigation and Safety Board Act* to provide to each minister and to each party having a direct interest in the findings of the board an opportunity, after completion of the aviation occurrence investigation and the gathering of the evidence, to make formal submissions within a time frame to be prescribed by the board, for consideration by the board in its deliberations.
- MCR 181 That section 26 of the *Canadian Transportation Accident Investigation and Safety Board Act* be amended to incorporate a specific provision entitling a party with a direct interest in an investigation or public inquiry to petition the board for reconsideration of the conclusions of its final report where it is shown that new and material evidence has been discovered subsequent to the conclusion of the investigative process and which might reasonably affect such conclusions or where it is shown that the board's factual conclusions are erroneous.
- MCR 182 That the *Canadian Transportation Accident Investigation and Safety Board Act* be amended to provide that all witness interviews conducted by investigators in connection with an aviation occurrence shall be tape recorded and transcribed.
- MCR 183 That the Transportation Safety Board of Canada add to its roster the names, addresses, and telephone numbers of highly qualified Canadian and international professional experts, learned in the various disciplines, who are willing to be called upon to assist in any given aviation occurrence investigation. Such a roster should be maintained and updated in consultation with the Canadian aviation community.

- MCR 184** That the Transportation Safety Board of Canada, as a matter of policy, establish a closer liaison with the National Aeronautical Research Establishment and the National Research Council Canada and, on an ad hoc basis, utilize to the fullest their facilities and staff experts in various applicable disciplines, to assist in the investigation of aviation accidents.
- MCR 185** That sections 24(5) and 24(6) of the *Canadian Transportation Accident Investigation and Safety Board (CTAISB) Act* be amended to empower the board with the responsibility and authority under law to track and follow up on an ongoing basis the action taken by the minister of transport with respect to each board safety recommendation and, if no action is taken by the minister within a specified time frame, to require an explanation in writing by the minister therefor. There should be a legislated mode of procedure that causes Transport Canada to commit itself to a resolution date, within a specified time frame, with respect to all board recommendations that are accepted by the minister, with an explanation for the time frame contemplated. In the event that the minister's action varies from the board recommendation, or if the minister proposes to take no action with respect to a recommendation of the board, then written reasons therefor should be provided to the board, and such reasons should be made available to the public.
- The other provisions of section 24 of the *CTAISB Act* should be amended accordingly in order to give full meaning and effect to the noted recommended amendments.
- MCR 186** That the annual report of the Transportation Safety Board of Canada continue to set out, as it now does, all of the recommendations, whether interim or final, that have been made by the board to the minister in the preceding year, but that it add comment regarding the actions taken by the minister in regard thereto.
- MCR 187** That the Transportation Safety Board of Canada provide forensic training to all its scientists and that the board call upon such outside resources as are necessary to assist them with such training.
- MCR 188** That the Transportation Safety Board of Canada formally adopt a policy recognizing that the investigation of human

factors involved in an aviation occurrence is a legitimate pursuit and an important element of the investigatory process.

- MCR 189 That the Transportation Safety Board of Canada formally adopt a policy recognizing that it is appropriate for the board to draw inferences of fact based on a preponderance of evidence and to refer to such inferences in its decision-making process.

Chapter 43 Objection to Production of Documents, Based on a Confidence of the Queen's Privy Council, Section 39, Canada Evidence Act, R.S.C. 1985, c.C-5

It is recommended:

- MCR 190 That section 39 of the *Canada Evidence Act*, R.S.C. 1985, c.C-5, be amended to empower a commissioner appointed under the *Inquiries Act* to make a determination in an in camera hearing as to the appropriateness of an objection, pursuant to the provisions of section 39 of the Act and based on a confidence of the Queen's Privy Council, to production of a document. Such determination should take into consideration the nature of the document in issue and its relevance and probative value to the subject matter of the inquiry, and should weigh the claim to confidence asserted under section 39 of the Act against the public interest in full disclosure of such document. In the alternative, the provisions of the *Inquiries Act* should be amended as required to give full meaning and effect to this recommendation.

Chapter 44 Inquiries Act, R.S.C. 1985, c.I-11, Section 13

It is recommended:

- MCR 191 That the provisions of section 13 of the *Inquiries Act* be reconsidered and that, at a minimum, appropriate amendments be introduced to provide:

- (a) a definition of the term "charge of misconduct," with particular focus on the meaning to be attached to the word "misconduct";
- (b) more precise direction as to the point in time that notice is to be given under section 13, taking into account the various difficulties that have been pointed out herein; and
- (c) an exemption from the notice provisions of section 13 in the case of Inquiries that have been conducted as quasi-judicial proceedings in the presence of counsel for the affected parties and with the attendant procedural and evidentiary safeguards discussed herein, or where it can otherwise be inferred that the person against whom the allegations are made had notice of the charges.

APPENDICES

Appendix A

P.C. 1989-532

Certified to be a true copy of a Minute of a Meeting of the Committee of the Privy Council, approved by Her Excellency the Governor General on the 29th day of March, 1989.



PRIVY COUNCIL

The Committee of the Privy Council, on the recommendation of the Minister of Transport, advise that a Commission do issue under Part I of the Inquiries Act and under the Great Seal of Canada, appointing the Honourable Virgil Peter Moshansky, a Justice of the Court of Queen's Bench of Alberta, to be a Commissioner to inquire into the contributing factors and causes of the crash of Air Ontario Flight 363 Fokker F-28 at Dryden, Ontario, on March 10, 1989, and report thereon, including such recommendations as the Commissioner may deem appropriate in the interests of aviation safety; and

The Committee do further advise that

- (a) the Commissioner be authorized to adopt such procedures and methods as he may from time to time deem expedient for the proper conduct of the inquiry;
- (b) the Commissioner be authorized to sit at such times and in such places as he may decide;
- (c) the Commissioner be authorized to rent such space and facilities as may be required for the purposes of the inquiry, in accordance with Treasury Board policies;
- (d) the Commissioner be authorized to engage the services of such experts and other persons as are referred to in section 11 of the Inquiries Act, at such rates of remuneration and reimbursement as may be approved by the Treasury Board;
- (e) the Commissioner be directed to advise the Governor in Council as to which, if any, of the groups or individuals that may appear before him, should receive assistance with respect to the legal costs they may incur in respect of those

P.C. 1989-532

- 2 -

appearances, and the extent of such assistance, where such assistance would, in the opinion of the Commissioner, be in the public interest;

(f) the Commissioner be directed

(i) to submit an interim report, in both official languages, to the Governor in Council not later than six months after the date of the appointment of the Commissioner and to submit any other interim reports to the Governor in Council, in both official languages, as, in the opinion of the Commissioner, may be required; and

(ii) to submit a final report, in both official languages, to the Governor in Council not later than March 30, 1990; and

(g) the Commissioner be directed to file the records and papers of the inquiry as soon as reasonably may be after the conclusion of the inquiry with the Clerk of the Privy Council.

CERTIFIED TO BE A TRUE COPY - COPIE CERTIFIÉE CONFORME



CLERK OF THE PRIVY COUNCIL - LE GREFFIER DU CONSEIL PRIVE

P.C. 1991-2591

Certified to be a true copy of a Minute of a Meeting of the Committee of the
Privy Council, approved by His Excellency the Governor General
on the 30th day of December, 1991



PRIVY COUNCIL

WHEREAS the **Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario** was directed to submit a final report, in both official languages, to the Governor in Council not later than December 31, 1991;

AND WHEREAS the Commission will not be in a position to submit its final report on or prior to December 31, 1991 and the Commissioner has requested an extension until March 31, 1992 to prepare and submit his report;

THEREFORE, the Committee of the Privy Council, on the recommendation of the Prime Minister, pursuant to Part I of the Inquiries Act, advises that a Commission do issue amending the Commission issued pursuant to Order in Council P.C. 1989-532 of March 29, 1989, as amended by Orders in Council P.C. 1990-625 of March 29, 1990, P.C. 1991-1187 of June 20, 1991 and P.C. 1991-1845 of September 26, 1991, by deleting therefrom the following paragraph:

"(f) the Commissioner be directed

(ii) to submit a final report, in both official languages, to the Governor in Council not later than December 31, 1991; and"

and by substituting therefor the following paragraph:

"(f) the Commissioner be directed

(ii) to submit a final report, in both official languages, to the Governor in Council not later than March 31, 1992; and"

CERTIFIED TO BE A TRUE COPY - COPIE CERTIFIÉE CONFORME

A handwritten signature in cursive script, likely belonging to the Clerk of the Privy Council.

CLERK OF THE PRIVY COUNCIL - LE GREFFIER DU CONSEIL PRIVE

Appendix B

Counsel and Representatives for Parties with Standing

	Counsel/Representatives
Commission Counsel	Frederick R. von Veh, QC <i>Commission counsel</i> <i>Stikeman, Elliott</i> <i>Toronto, Ontario</i> Gregory L. Wells <i>Associate Commission counsel</i> <i>Calgary, Alberta</i>
Staff Counsel	Adam S. Albright William R. Cottick Laurence C. Goldberg William M. McIntosh Douglas M. Worndl
Counsel to the Commission	W. Ian C. Binnie, QC Peter H. Griffin <i>McCarthy, Tétrault</i> <i>Toronto, Ontario</i>
Chief Coroner of Ontario	Paul A. Bailey <i>Crown Attorney</i> <i>Chatham, Ontario</i>
Air Canada	Rémi J. Lafrenière, QC <i>Air Canada</i> <i>Montreal, Quebec</i>
Aircraft Operations Groups Association (AOGA)	R.A. Peters <i>Aircraft Operations Groups</i> <i>Association</i> <i>Ottawa, Ontario</i>

Air Ontario Inc.

D. Bruce MacDougall, QC
Gerard A. Chouest
William J. Dunlop
Peter M. Jacobsen
Ann Bourke (student-at-law)
Paterson, MacDougall
Toronto, Ontario

Canadian Air Line Pilots
Association (CALPA)

John T. Keenan
Linda P. Thayer
Gravenor Keenan
Montreal, Quebec

Canadian Airlines
International

Donald I. Brenner, QC
Scott W. Fleming
Brenner & Company
Vancouver, British Columbia

Canadian Union of Public
Employees (CUPE),
Airline Division

Leanne M. Chahley
Caley & Wray
Toronto, Ontario

Fokker Aircraft B.V.

G. Robert W. Gale, QC
Blake, Cassels & Graydon
Toronto, Ontario

Menasco Aerospace Ltd

Berndt Weber
Technical Representative
Product Support
Menasco Aerospace Ltd
Oakville, Ontario

Rolls-Royce Ltd

Eric M. Lane
Allister Ogilvie
Lane, Allen
Toronto, Ontario

Survivors
and
Estates of Victims

Kristopher H. Knutsen, QC
W. Danial Newton
Carrel & Partners
Thunder Bay, Ontario

S. Alexander Zaitzeff
Zaitzeff, Canade
Thunder Bay, Ontario

Toronto Star
(Torstar Corporation)
and Canadian Press

J. Blair Mackenzie
Torstar Corp.
Toronto, Ontario

Town of Dryden
and
Dryden Municipal Airport

David A. Tompkins
Katherine A. Auvinen
Bell, Temple
Toronto, Ontario

Terrence A. Platana
McAuley & Partners
Dryden, Ontario

Transport Canada
and
Attorney General of Canada

Duff F. Friesen, QC
Department of Justice
Ottawa, Ontario

J. Sanderson Graham
D.M. Fiorita
Transport Canada Legal Services
Ottawa, Ontario

Appendix C

Parties Granted Full, Limited, and Special Participant Status and Observer Status

Full Participant Status

Air Ontario Inc.

Canadian Air Line Pilots Association

Canadian Union of Public Employees, Airline Division

Chief Coroner of Ontario

Fokker Aircraft B.V.

Her Majesty the Queen, as represented by the minister of
transport and the attorney general of Canada

Town of Dryden and Dryden Municipal Airport

Limited Participant Status

Air Canada

Canadian Airlines International

Menasco Aerospace Ltd

Rolls-Royce Ltd

Toronto Star/Canadian Press

Special Participant Status

Survivors and estates of victims

Observers

Aircraft Operations Group

Appendix D

Witnesses Appearing before the Inquiry

Witness	Date and Place of Testimony
Brian Gordon Adams Survivor of the crash	September 27, 1989 Thunder Bay
David Jeffrey Adams Air safety investigator Australian Bureau of Air Safety Investigation Canberra, Australia	December 17, 1990 Toronto
Richard Irvin Adams Independent consultant on de-icing technology Newport News, Virginia, U.S.A.	June 18, 1990 Toronto
Angus Moncrieff (Monty) Allan Pilot Air Ontario (Toronto)	August 14, 1990 Toronto
Norbert Wolfgang Altmann Pilot Bearskin Air Services	November 14, 1989 Toronto
Gert Ingemar Andersson Pilot Linjeflyg Airlines Stockholm, Sweden	June 21/22, 1990 Toronto
Ronald Douglas Armstrong Regional director Aviation Regulation Directorate, Ontario Region Transport Canada	October 22/23, 1990 Toronto

Witness	Date and Place of Testimony
John Ashmore Maintenance control manager Air Ontario (London)	March 29, 1990 Toronto
Kostas J. (Gus) Athanasiou Crew chief Air Ontario (Toronto)	February 2, 1990 Toronto
Joseph P. Bajada Aircraft maintenance engineer Aircraft Analysis Section Canadian Aviation Safety Board	April 4/5, 1990 Toronto
Tara Kim Barton Customer service agent Canadian Partner and Dryden Air Services	November 17, 1989 Toronto
Diane May Beasant Owner and president Dryden Air Services	November 23, 1989 Toronto
Mark Arthur Beasant Officer, Ontario Provincial Police Part-time ramp servicer Dryden Air Services	November 23, 1989 Toronto
Lawrence Eldon Beeler President Dryden Flight Centre	November 15/16, 1989 Toronto
David John Berezuk Survivor of the crash Pilot Air Ontario (Thunder Bay)	September 25/26/27, 1989 Thunder Bay
Alfred Bertram Survivor of the crash Flight service specialist Transport Canada Rankin Inlet, Northwest Territories	September 29, 1989 Thunder Bay

Witness	Date and Place of Testimony
John Wesley Biro Survivor of the crash	October 12, 1989 Thunder Bay
Kenneth Richard Bittle Vice-president of maintenance and engineering Air Ontario	August 29/30/31, 1990 Toronto
Brian Gene Boucher Pilot Air Canada (Toronto) Part-time director of training Niagara-on-the-Lake Fire Department	April 26, 1990 Toronto
Arthur Ernest Bourre Weather observer and equipment operator Dryden Municipal Airport	November 22, 1989 Toronto
Wilson John Boynton Supervisor of engineering Air Ontario (London)	February 16, 1990 Toronto
Jill Edith Brannan Ticket and boarding agent Dryden Flight Centre	October 11, 1989 Thunder Bay
Martin Herbert Brayman Retired regional superintendent Air Carrier Inspection (Large Aeroplanes) Division Aviation Regulation Directorate Ontario Region Transport Canada	October 31/November 1, 1990 Toronto
Steven George Brezden Retired aircraft maintenance engineer Air Ontario (Winnipeg)	February 16, 1990 Toronto

Witness	Date and Place of Testimony
Craig Michael Brown Pilot Terraquest Limited	July 19, 1989 Dryden
Morgan Brown Lead station attendant Air Canada (Thunder Bay)	March 27, 1990 Toronto
Warren James Brown Dispatcher Air Ontario (London)	February 21, 1990 Toronto
Charles Thomas Bruzell Customer services manager Air Canada (Winnipeg)	February 20, 1990 Toronto
John C. Callan Chief administrative officer Town of Dryden	July 18, 1989 Dryden
Ricardo Alfonso Campbell Survivor of the crash	September 28, 1989 Thunder Bay
Claude Castonguay Pilot Air Ontario	September 10, 1990 Toronto
Peter Bonham Clay Independent expert witness for Rolls-Royce engine teardown and performance	April 5/6, 1990 Toronto
Rodney John Coates Regional manager of customer services Air Ontario (Toronto)	March 28, 1990 Toronto
Vaughan Stephen Cochrane General manager Dryden Flight Centre	March 6/7/8, 1990 Toronto

Witness	Date and Place of Testimony
Russell Wayne Copeland Dispatcher Air Ontario (London)	February 15, 1990 Toronto
Donald Leslie Crawshaw Survivor of the crash	September 28, 1989 Thunder Bay
Douglas Gary Davis Sergeant Ontario Provincial Police Dryden Detachment	July 20/24, 1989 Dryden
Charles Joseph Deluce F-28 chief pilot and project manager Air Ontario (Toronto)	September 17/18/19/20/21, 1990 December 3/4, 1990 Toronto
William Stanley Deluce President and chief executive officer Air Ontario (London)	December 10/11/12/13, 1990 Toronto
Donald James Douglas Regional director Air Navigation Directorate Pacific Region Transport Canada	November 23, 1990 Toronto
Henry Abram Dyck Superintendent Air Carrier Inspection Division Airworthiness Branch Aviation Regulation Directorate Transport Canada Headquarters	November 13/14/15/16, 1990 Toronto
James Lemar Esh Employee Dryden Flight Centre and Dryden Air Services	November 16, 1989 Toronto
Michael Andrew Ferguson Survivor of the crash	September 14, 1989 Thunder Bay

Witness	Date and Place of Testimony
Susan Mary Ferguson Survivor of the crash	September 14, 1989 Thunder Bay
Rita Figliomeni Flight attendant Air Ontario (Thunder Bay)	March 27, 1990 Toronto
Jerry Deroal Fillier Ramp attendant and refueller Dryden Flight Centre	November 17, 1989 Toronto
James Edward Foot Electrical/mechanical engineering specialist Canadian Aviation Safety Board	April 3/4, 1990 Toronto
Keith Warren Fox Pilot and flight 1363 passenger Air Ontario (Toronto)	March 5/6, 1990 Toronto
Michael Gatto Survivor of the crash	September 14, 1989 Thunder Bay
Raymond Martin Gibbs Pilot Bearskin Air Services	November 15, 1989 Toronto
Raymond Marshall Godfrey Volunteer fire-fighter Unorganized Territories of Ontario Fire Department Wainwright Township, Ontario	July 24, 1989 Dryden ~
Daniel Martin Godin Survivor of the crash	September 28, 1989 Thunder Bay
Arthur Edward Grenier Constable Ontario Provincial Police Sioux Lookout Detachment	March 27, 1990 Toronto

Witness	Date and Place of Testimony
Thomas Richard Groves Meteorological observer Dryden Municipal Airport	July 20, 1989 Dryden
Harold Murray Haines Survivor of the crash Pilot Air Canada (Sioux Lookout, Ontario)	October 10, 1989 Thunder Bay
Jeffrey Earl Hamilton Emergency services officer Airports Authority Group Central Region Transport Canada	December 7/8, 1989 Toronto
Stephen John Hanley Emergency medical care attendant and paramedic Air Ambulance Unit Ontario Ministry of Health Sioux Lookout Detachment	July 25, 1989 Dryden
Erik Bent Hansen Pilot Air Ontario (London)	August 17, 1990 Toronto
Linda Marie Harder Ticket and boarding agent Dryden Flight Centre	November 17, 1989 Toronto
Thomas James Harris Survivor of the crash	September 13, 1989 Thunder Bay
Sonia Victoria Hartwick Survivor of the crash Flight attendant Air Ontario (Thunder Bay)	September 11/12/13, 1989 Thunder Bay

Witness	Date and Place of Testimony
Allan Clifford Haw Airport mechanic and auxiliary fire-fighter Dryden Municipal Airport	November 17, 1989 Toronto
Robert Louis Helmreich Professor of Psychology University of Texas Austin, Texas, U.S.A.	December 18/19/20, 1990 Toronto
Eugene Garnett Hill Manager, Certification and configuration development Renton Division Boeing Aircraft Seattle, Washington, U.S.A.	June 19, 1990 Toronto
Roscoe Miner Carlyle Hodgins Owner and pilot General Air Spray Ltd	November 14, 1989 Toronto
Mogens Johannes (John) Holm Superintendent, Air Operations Airports Authority Group Transport Canada	June 14, 1990 Toronto
James Walrond Hutchinson Chief, Engineering Analysis Division Canadian Aviation Safety Board	April 9/10, 1990 Toronto
Allan Wesley Hymers Water bomber pilot Ministry of Natural Resources Dryden, Ontario	October 12, 1989 Thunder Bay
Gary Edward Jackson Survivor of the crash	September 27, 1989 Thunder Bay

Witness	Date and Place of Testimony
Joseph Edward Jackson Investigator in charge Accident Investigation Team Canadian Aviation Safety Board	February 23, 1990 March 6/8, 1990 April 3, 1990 Toronto
Bjarne Krog (Brian) Jensen Manager, airport operations and ground equipment services Air Canada (Montreal)	June 22, 1990 Toronto
Paul Scott Jensen Pilot Air Ontario	September 11/12, 1990 Toronto
John Jerabek Line maintenance supervisor Air Ontario (Toronto)	February 1, 1990 Toronto
Thomas Sidney Jones Mayor Town of Dryden	July 17, 1989 Dryden
George MacGregor Knox Acting regional director-general Airports Authority Group Central Region Transport Canada	January 25/26, 1990 Toronto
Ernest Kobelka Emergency medical care attendant Dryden District General Hospital	July 25, 1989 Dryden
Danilo (Dean) Koncan Duty manager, Operations Air Ontario (London)	February 20, 1990 Toronto
Steve Korotyszyn Aircraft maintenance engineer and lead inspector Air Ontario (Toronto)	February 2, 1990 Toronto

Witness	Date and Place of Testimony
Martin Joseph Kothbauer Duty manager System Operations Control Air Ontario (London)	February 22, 1990 Toronto
Stanley Michael Kruger Crew chief Crash Fire Rescue Unit Dryden Municipal Airport	November 20/21, 1989 Toronto
Alana Labelle-Hellmann Flight attendant Air Ontario	September 11, 1990 Toronto
Claude André LaFrance Formerly assistant deputy minister of aviation Transport Canada Headquarters	January 17, 1991 Toronto
Jack Lampe Manager, Cargo services, and de-icing commissioner United Airlines Chicago, Illinois, U.S.A.	June 20, 1990 Toronto
Daniel Keith Lavery Dispatcher Air Ontario (London)	February 21, 1990 Toronto
Paul Richard Lefebvre Station attendant and co-chairman Safety and Health Committee Air Canada (Toronto)	June 15, 1990 Toronto
Gary Donald Harvey Linger Owner ESSO Flight Refuelling Thunder Bay Airport	March 27, 1990 Toronto

Witness	Date and Place of Testimony
Peter Allan Louttit Airport manager Dryden Municipal Airport	July 18/19, 1989 Dryden
Lloyd Alexander McCoomb Director-general Safety and Technical Services Transport Canada Headquarters	June 26, 1990 Toronto
Gerald Hubert McCrae Volunteer fire-fighter Unorganized Territories of Ontario Fire Department Wainwright Township, Ontario	July 24, 1989 Dryden
Thomas Dickson (Dick) McDonald Chairman, Airport Commission Dryden Municipal Airport	July 25, 1989 Dryden
Bryce Neale MacGregor Acting chief Operations and Certification Division Aviation Regulation Directorate Transport Canada Headquarters	November 20/21, 1990 Toronto
Robert Carl McGogy Private pilot	November 14, 1989 Toronto
Jack Lyle McInnis Flight refueller ESSO Flight Refuelling Thunder Bay Airport	March 27, 1990 Toronto
Kelly Mackenzie Survivor of the crash	October 10, 1989 Thunder Bay
Louis John Maltais Fire chief Town of Dryden	July 18, 1989 Dryden

Witness	Date and Place of Testimony
Ronald Peter Mandich Survivor of the crash Green Bay, Wisconsin, U.S.A.	September 28, 1989 Thunder Bay
Gregory John Martin Physician and coroner Town of Dryden	July 24, 1989 Dryden
Henry Christian (Chris) Maybury Pilot Air Ontario (London)	August 15, 1990 Toronto
Charles O. (Chuck) Miller Aviation safety consultant System Safety Inc. Sedona, Arizona, U.S.A.	December 17, 1990 Toronto
Paul Orval Miller Sergeant and identification officer Technical Identification Services Unit Ontario Provincial Police Kenora Detachment	July 17, 1989 Dryden
John Arthur (Jack) Mitchell Director of flight safety Air Canada (Montreal)	October 9/10, 1990 Toronto
Henry Lucas Moore Director Airport Safety Services Branch Safety and Technical Services Directorate Transport Canada Headquarters	January 26, 1990 Toronto
John Murray Morgan Physicist Manager, In-flight simulator National Aeronautical Establishment National Research Council	May 3, 1990 Toronto

Witness	Date and Place of Testimony
Gregory Francis George Morrison Aircraft maintenance engineer and supervisor Air Ontario (Winnipeg)	March 9, 1990 Toronto
James Arthur Angus Morrison Pilot and vice-president of flight operations Air Ontario (London)	October 1/2/3, 1990 Toronto
Fernand Mousseau Director-general Policy Planning and Resource Development Directorate Transport Canada Headquarters	December 1, 1990 January 14, 1991 Toronto
David D. Murdoch Forensic climatologist Scientific Services Division Environment Canada	April 25, 1990 Toronto
John Leonard (Len) Murray Air carrier inspector Air Carrier Inspection (Large Aeroplanes) Division Aviation Regulation Directorate Seventh Region Transport Canada	November 2/13, 1990 Toronto
Weldon Ralph Newton Director-general Aviation Regulation Directorate Transport Canada Headquarters	January 15/16, 1991 Toronto
Jack Paul Nicholson Emergency services officer and acting superintendent Emergency Services/Crash Fire Rescue Airports Authority Group Central Region Transport Canada	December 5/6/7, 1989 Toronto

Witness	Date and Place of Testimony
Ole Tindbaek Nielsen Regional superintendent Air Carrier Maintenance Division Airworthiness Branch Aviation Regulations Directorate Ontario Region Transport Canada	October 29/30, 1990 Toronto
Roger Nordlund Fire chief Unorganized Territories of Ontario Fire Department Wainwright Township, Ontario	July 24, 1989 Dryden
Lawrence Trevor Northcott Water bomber pilot Ministry of Natural Resources Dryden, Ontario	October 12, 1989 Thunder Bay
Robert Victor Nyman Pilot and director of flight operations Air Ontario (Toronto)	September 12/13/14, 1990 September 17, 1990 Toronto
Larry Charles O'Bray Superintendent Emergency Services/Crash Fire Rescue Airports Authority Group Central Region Transport Canada	January 23/24, 1990 Toronto
William O'Connell Lead station attendant Air Canada (Winnipeg)	March 29, 1990 Toronto
Myron Morris Oleskiw Geophysicist, meteorologist, and associate research officer Low Temperature Laboratory National Research Council	April 26, 1990 Toronto

Witness	Date and Place of Testimony
Teoman Ozdener F-28 maintenance manager Air Ontario (Toronto)	August 28/29, 1990 Toronto
Frederick Ernest Arnold Parry Chief, Crash Fire Rescue Dryden Municipal Airport	July 20/21, 1989 July 24, 1989 Dryden
David Alan Patrick Supervising meteorologist Atmospheric Environment Services Environment Canada (Winnipeg)	February 21/22, 1990 Toronto
Robert Douglas Perkins Pilot Air Ontario (Toronto)	February 13/14, 1990 Toronto
Brian Martin Perozak Survivor of the crash	September 27, 1989 Thunder Bay
James Erwin Perry Manager, Community Airports Central Region Transport Canada (Winnipeg)	January 25, 1990 Toronto
Carol Anne Petrocovich Flight 1363 passenger Dryden, Ontario	November 20, 1989 Toronto
Kenneth Martin Pickwick Physical metallurgist Chief of Physical Analysis Canadian Aviation Safety Board	April 5, 1990 Toronto
Harold Christopher Pike Maintenance employee Dryden Municipal Airport	November 22, 1989 Toronto

Witness	Date and Place of Testimony
Earl Randy Pitcher Civil aviation inspector Air Carrier Inspection (Large Aeroplanes) Division Aviation Regulation Directorate Ontario Region Transport Canada	October 24/25/26, 1990 Toronto
Michael Roland Poole Superintendent Flight Recorders and Computers Engineering Branch Canadian Aviation Safety Board	April 9, 1990 Toronto
Channan (Ken) Ramnarine Aircraft maintenance engineer and crew chief Air Ontario (Toronto)	February 1, 1990 Toronto
Desmond James Risto Regional airports disaster planning and protective officer Airports Authority Group Central Region Transport Canada (Winnipeg)	December 4, 1989 Toronto
Gary Albert Rivard Fire-fighter Crash Fire Rescue Unit Dryden Municipal Airport	November 22, 1989 Toronto
David George Rohrer Senior aviation safety officer Canadian Aviation Safety Board	July 3/4/5/6, 1990 Toronto
Erving James Rolfe Maintenance control supervisor Air Ontario (London)	March 28, 1990 Toronto

Witness	Date and Place of Testimony
William John Alan Rowe Senior vice-president Western Canada & Pacific Rim Region Air Canada (Vancouver)	October 12/13, 1990 Toronto
Adrian (Sandy) Sandziuk Flight dispatcher Air Canada (Toronto)	December 14, 1990 Toronto
Brian Edward Sheppard Senior instrument meteorologist Environment Canada	April 11, 1990 Toronto
Peter Shewchuk Station agent/radio operator Air Canada (Thunder Bay)	February 23, 1990 Toronto
David John Shuel Lead attendant Air Canada (Winnipeg)	February 20, 1990 Toronto
Charles Herbert Simpson Pilot and senior vice-president of flight operations Air Canada (Montreal)	October 5, 1990 October 15, 1990 Toronto
Donald Ross Sinclair Regional manager Air Carrier Operations Branch Aviation Regulation Directorate Ontario Region Transport Canada	November 22, 1990 Toronto
Kenneth Alexander Sinclair Assistant deputy minister of policy and coordination Transport Canada Headquarters	January 21, 1991 Toronto

Witness	Date and Place of Testimony
Roderick William Slaughter Director, Flight Standards Branch Aviation Group Aviation Regulation Directorate Transport Canada Headquarters	November 27/28/29/30, 1990 Toronto
Allan Roy Slota Chairman, Emergency Services Town of Dryden Red Cross	July 25, 1989 Dryden
Reginald Harry James Smith Pilot Air Canada (Montreal)	June 12, 1990 Toronto
Ronald Bradley Somers Pilot Air Ontario (London)	January 30/31, 1990 Toronto
Ronald Cameron Stewart Flight safety officer and pilot Air Ontario (London)	May 22/23, 1990 August 20/21, 1990 Toronto
Deborah Marie Stoger Pilot Air Ontario (Toronto)	August 16, 1990 Toronto
Elaine Margaret Summers Aircraft maintenance engineer and technical investigator Canadian Aviation Safety Board	April 10/11, 1990 Toronto
Dennis Lee Swift Survivor of the crash	September 29, 1989 Thunder Bay
Thomas John Syme Executive vice-president Commercial Services Air Ontario (London)	August 22/23/24, 1990 August 27, 1990 Toronto

Witness	Date and Place of Testimony
William John Taylor Project officer and chief, Aircraft Analysis Engineering Branch Canadian Aviation Safety Board	April 6, 1990 Toronto
Uwe Ulrich Teubert Survivor of the crash	September 28, 1989 Thunder Bay
Paulette Theberge Community airports officer Airport Authority Group Central Region Transport Canada (Winnipeg)	January 24/25, 1990 Toronto
Andrew Basil Triolaire Director, Safety and Environment Canadian Airlines International Chairman, Safety Advisory Committee Air Transport Association of Canada	June 25, 1990 Toronto
Alan Ian Umbach Superintendent Air Carrier Operations Division Aviation Group Aviation Regulation Directorate Transport Canada Headquarters	November 17, 1990 November 19/20, 1990 Toronto
Jack van Hengst Chief aerodynamic analyst Fokker Aircraft B.V. Schiphol, The Netherlands	May 1/2, 1990 Toronto
Clare Rodney Vasey Unit operations specialist Airport Control Service Pearson International Airport	June 13, 1990 Toronto

Witness	Date and Place of Testimony
Gary Alan Wagner Pilot Air Canada Physicist/aeronautical engineer Adjunct professor Concordia University Montreal, Quebec	May 4, 1990 Toronto
Sandra Ruth Walker Emergency medical care attendant Dryden District General Hospital	July 25, 1989 Dryden
Richard Waller Survivor of the crash	September 29, 1989 Thunder Bay
Mary Ellen Ward Senior crew scheduler System Operations Control Air Ontario (London)	March 27, 1990 Toronto
Richard Herbert Wickens Mechanical engineer and senior research officer Low Speed Aerodynamics Laboratory National Aeronautical Establishment National Research Council	April 30, 1990 Toronto
David Philip Wightman Assistant deputy minister of aviation Transport Canada Headquarters	January 22, 1991 Toronto
William D. Wilcox Pilot Air Ontario (Toronto)	August 16/17, 1990 Toronto
Ramsey Muir Withers Formerly deputy minister Transport Canada	January 18, 1991 Toronto

Witness

Cherry Leigh Wolframe
Customer service agent
Canadian Partner and
Dryden Air Services

Date and Place of Testimony

November 23, 1989
Toronto

Appendix E

Inquiry Schedule

Hearings

Commenced	May 26, 1989
Closed	January 24, 1991
Total number of days of hearings	168

Hearing Dates

Week 1	May 26, 1989 (preliminary hearing)	Toronto
Week 2	June 16, 1989 (preliminary hearing)	Toronto
Week 3	July 17–21, 1989	Dryden
Week 4	July 24–25, 1989	Dryden
Week 5	September 11–14, 1989	Thunder Bay
Week 6	September 25–29, 1989	Thunder Bay
Week 7	October 10–12, 1989	Thunder Bay
Week 8	November 14–17, 1989	Toronto
Week 9	November 20–23, 1989	Toronto
Week 10	December 4–8, 1989	Toronto
Week 11	January 23–26, 1990	Toronto
Week 12	January 30 – February 2, 1990	Toronto
Week 13	February 13–16, 1990	Toronto
Week 14	February 20–23, 1990	Toronto
Week 15	March 5–9, 1990	Toronto
Week 16	March 27–29, 1990	Toronto
Week 17	April 3–6, 1990	Toronto
Week 18	April 9–11, 1990	Toronto
Week 19	April 23, 25–26, 1990	Toronto
Week 20	April 30 – May 4, 1990	Toronto
Week 21	May 22–23, 1990	Toronto
Week 22	June 12–15, 1990	Toronto
Week 23	June 18–22, 1990	Toronto
Week 24	June 25–26, 1990	Toronto
Week 25	July 3–6, 1990	Toronto
Week 26	August 14–17, 1990	Toronto
Week 27	August 20–24, 1990	Toronto
Week 28	August 27–31, 1990	Toronto
Week 29	September 10–14, 1990	Toronto
Week 30	September 17–21, 1990	Toronto
Week 31	October 1–3, 5, 1990	Toronto

Week 32	October 9–10, 12–13, 1990	Toronto
Week 33	October 15, 1990	Toronto
Week 34	October 22–26, 1990	Toronto
Week 35	October 29 – November 2, 1990	Toronto
Week 36	November 13–17, 1990	Toronto
Week 37	November 19–23, 1990	Toronto
Week 38	November 27 – December 1, 1990	Toronto
Week 39	December 3–4, 1990	Toronto
Week 40	December 10–14, 1990	Toronto
Week 41	December 17–20, 1990	Toronto
Week 42	January 14–18, 1990	Toronto
Week 43	January 21–22, 1991	Toronto
	January 23–24, 1991 (Submissions)	Toronto

Transcripts

168 volumes 33,648 pages

Exhibits

Total number of public exhibits 1343

Witnesses

Total number of witnesses called at the Inquiry 166

Appendix F

**Ministry of
the Solicitor
General**

Office of
the Chief
Coroner

26 Grenville Street
Toronto, Ontario M7A 2G9

**Ministère du
Solliciteur
général**

Bureau du
coroner
en chef

26, rue Grenville
Toronto (Ontario) M7A 2G9

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(416) 965-6678

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(416) 324-3766

July 15, 1991

The Honourable Virgil P. Moshansky
Commissioner
Commission of Inquiry into the
Air Ontario Crash at Dryden, Ontario
595 Bay Street, 14th Floor
Toronto, Ontario
M5G 2C2

Dear Sir:

As Chief Coroner for the Province of Ontario, it is my responsibility to ensure that all deaths within Ontario are investigated with the following three principles in mind:

- 1) the public must be satisfied that the death of any member of the community will not be taken lightly, but instead will be as fully and completely investigated as is reasonably possible;
- 2) all of the facts surrounding each death must be made known to the public;
- 3) most importantly, those deaths which are preventable must be identified and all efforts made to delineate and invoke practical recommendations with a view to preventing similar deaths in future.

As a result of investigations into aviation accidents in Canada prior to the Air Ontario crash at Dryden, Dr. Bennett, the Chief Coroner at that time, and I were concerned about the margin of safety in the Canadian aviation industry.

A review of the literature demonstrates that enlightened accident investigation entails a careful analysis of the human factors aspects of a crash. In other words, it is not sufficient simply to

identify the ultimate error resulting in the crash without further exploring the pressures and influences which allow or, in some cases, invite that ultimate error to occur. In this context, we were concerned that deaths resulting from aviation accidents were not being examined in sufficient depth to prevent the recurrence of similar deaths in future.

At the inception of the Commission of Inquiry, you invited the Office of the Chief Coroner to participate fully in the Inquiry process. At their first meeting with you, our representatives expressed to you the concerns which Dr. Bennett and I shared. They were assured from the start that this Inquiry would be conducted in an open forum, would be thorough, and would give full attention to the human factors analysis approach of accident investigation. Such an approach was needed and was overdue. It was on this basis that we determined that a separate and parallel investigation in the form of a coroner's inquest would be unnecessary, inefficient, and perhaps counterproductive, and that the expense associated with full participation throughout the Inquiry process was fully justified. In the course of time I have become absolutely convinced that this was the correct decision.

For the purposes of representing the Chief Coroner at the Commission of Inquiry, we chose Mr. Paul Bailey, Crown Attorney for the County of Kent, and Dr. Robert Huxter, Regional Coroner for Metropolitan Toronto. Each of these individuals came equipped with extensive investigative and aviation experience. I trust that Mr. Bailey and Dr. Huxter were able to assist in and enhance the process by which the evidence that came before you was gathered, tested, and analysed.

It is an arduous task to preside over a public hearing. Participating interest groups often have competing interests and conflict is inevitable. Your approach to the varying interests have allowed everyone to be heard without any compromise with respect to ascertaining the truth. The interests of aviation safety are well served by your experience and wisdom in this regard.

I have been kept apprised on an ongoing basis of the facts discovered and the conclusions reached by you. I am pleased to assert unequivocally that the interests and goals of the Office of the Chief Coroner on behalf of the Province of Ontario have been fully met by the Commission of Inquiry into the Air Ontario Crash at Dryden. In my opinion, your Commission of Inquiry has established a new and badly needed benchmark for the investigation of major aviation accidents in Canada.


Page 3

I fully endorse the approach you took, and the recommendations you have made. In the event of a further major accident, I am confident that my colleagues in other provinces and I will carefully compare the actual performance of the aviation industry and aviation regulators with the standard of conduct you have carefully delineated in your reports.

It is my hope that such scrutiny will not be needed. I strongly urge that the individuals and organizations that are mandated to invoke your recommendations do so. I am encouraged by the improvements that have already been made by air carriers and Transport Canada. The further changes you advocate, however, must also be effected. Only then will a recurrence of the death and suffering caused by the Dryden crash be avoided.

Thank you again for the opportunity of collaborating on this worthwhile endeavour.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "James G. Young" followed by a small mark that looks like "MO".

James G. Young, M.D.
Chief Coroner for Ontario

JGY:fl

Appendix G

Time Sequence of Events during the Station Stop at Dryden Municipal Airport and Events Occurring at the Crash Site, March 10, 1989

The following time sequence of events surrounding Air Ontario flight 1363 on March 10, 1989, is based on information from the following sources:

- Piedmont Airlines' F-28 Operations Manual
- Transcript of Kenora Flight Service Station (FSS) taped log
- Data from simulator trials carried out by the Canadian Aviation Safety Board's (CASB) flight operations group
- Testimony of witnesses
- Ambulance tachographs
- Dryden and airport fire channel tape

References in *italic* type are to exact times; all references in roman type are best estimates.

Time	Events
11:39 a.m.	Flight 1363 lands at Dryden
11:40	Flight ramps at Dryden. Flight is marshalled in by Mr Vaughan Cochrane, with Mr Jerry Fillier standing by with baggage cart. Light snow falling; none accumulating on the ramp or the aircraft.
11:41	Mr Cochrane puts in nose-wheel chocks and stands by the front door while flight attendant opens it. Mr Fillier proceeds to forward cargo hold to unload and load baggage.
11:42	First Officer (FO) Keith Mills leaves cockpit and goes to lavatory at rear of aircraft. Captain George Morwood remains in seat.

Time	Events
11:43	Mr Cochrane goes to cockpit to give pilots the baggage count. (He does not remember whether or not both pilots were there at that time.) Mr Cochrane leaves cockpit and tells Mr Fillier to get the fuel truck. Mr Cochrane then goes into the terminal and calls crash, fire-fighting, and rescue (CFR) unit.
11:45	FO Keith Fox, a passenger travelling from Thunder Bay to Dryden, talks to Mr Cochrane at the Air Ontario ticket counter.
11:47	FO Fox returns to cockpit to inquire about missing baggage. He speaks with Captain Morwood; FO Mills is not in the cockpit. Still snowing. Intensity has increased. Special weather observation taken at 1747Z (issued at 1748Z) shows visibility reduced to 2 ½ miles in snow. Snow starting to accumulate on the wings.
11:48	Mr Fillier returns with fuel truck. Does not hook up but proceeds to cockpit to get details for refuelling. Both pilots are in cockpit. Captain tells Mr Fillier that 13,000 pounds total is required – 6500 pounds per side.
11:50	Mr Fillier commences to hook up for refuelling when Mr Cochrane returns and tells him to refuel a NorOntair flight and a Cessna 206. Both these aircraft are parked in front of the fuel pumps.
11:52	Captain Morwood leaves cockpit and proceeds into terminal. He is seen by Mr Fillier leaving the aircraft as the latter walks towards the NorOntair flight. Light, wet snow falling; more is accumulating on wings. Weather observation taken about 1750Z (issued at 1800Z) gives visibility as 2 ½ miles in light snow.
11:53	Captain Morwood arrives at Air Ontario ticket counter and talks with Ms Jill Brannan.
11:56:03	<i>FO Mills calls YQK FSS: "Kenora Dryden it's Ontario 363."</i>
11:56:10	<i>YQK FSS replies: "Ontario 363 Kenora."</i>

Time	Events
11:56:16	GX 363: "Yes Sir, we are just sitting on the ramp here, I wonder if you could in Dryden could you go ahead the latest Brandon, Winnipeg, Kenora, ahh and Thunder Bay please."
11:56:31	YQK FSS: "Roger stand by."
11:56:48	YQK FSS: "And for Ontario 363 Kenora the Winnipeg weather, seventeen hundred sky partially obscured, five hundred then scattered. Twelve thousand thin broken visibility three fog. Temperature two dew point zero, wind one two zero wind one twenty at ten, altimeter three zero zero one. At Thunder Bay sky partially obscured, four thousand, five hundred scattered, measured ceiling seven thousand broken, nine thousand overcast, one and a half miles in fog, temperature minus two, dew point minus three, winds calm, altimeter 30.17, sun dimly visible, and was that Brandon and what other location?"
11:57:30	GX 363: "Brandon, Kenora, also Canadian Sault please."
11:57:36	YQK FSS: "Roger, Brandon balloon ceiling eight hundred overcast, three miles fog, temperature one, dew point zero, winds one forty degrees at six, altimeter two nine nine six, stratus nine. Kenora we are at two thousand special at one seven one seven, two thousand two hundred scattered, estimated ceiling five thousand broken, four miles fog, temperature zero, dew point minus two, one zero zero degrees five, altimeter three zero one zero. Canadian Soo eight thousand thin broken, estimated ceiling two seven thousand broken, visibility more than fifteen, temperature zero, dew point minus six, wind one four zero degrees nine, altimeter three zero three two."
11:58:00	Captain places call to London SOC centre from telephone at the ticket counter.
11:58:28	GX 363: "Okay let me check those all okay. And can we have an updated terminal please for if there's any amendments to Dryden, Kenora, and Winnipeg please."

Time	Events
11:58:47	YQK FSS: <i>"The Dryden forecast valid from seventeen hundred to zero three hundred is for three thousand scattered, ceiling is ten thousand overcast, occasionally ceiling's three thousand broken, ten thousand overcast, five miles in light rain, light freezing rain and fog, becoming by nineteen hundred Universal eight hundred scattered, ceiling's four thousand overcast, occasionally sky partially obscured, ceiling's eight hundred overcast, two miles light rain, fog, risk of a light thunder shower til twenty-one hundred Universal and after zero zero ceilings fifteen hundred broken, four thousand overcast. For Kenora, valid from seventeen hundred Universal, seven hundred scattered, ceiling's four thousand overcast, five miles light snow showers, occasionally sky partially obscured, ceiling seven hundred overcast, one mile light rain showers, light snow showers, fog, risk of a thunder shower in snow, becoming by nineteen hundred eight hundred scattered, ceilings four thousand broken occasionally, sky partially obscured ceilings eight hundred broken, five miles fog, by twenty-one hundred Universal fifteen hundred scattered, ceilings four thousand broken, occasionally ceilings fifteen hundred broken, four thousand broken, how on that so far?"</i>
11:59:50	Captain completes call to dispatch and starts back to aircraft. Before returning to aircraft the captain speaks with FO Fox and Ms Carol Anne Petrocovich, both passengers who had travelled from Thunder Bay to Dryden, at the Dryden Flight Centre counter.
12:00:10 p.m.	Captain arrives in cockpit
12:00:15	GX 363: <i>"Okay we got that pretty much okay the, it's after twenty-one Z Kenora goes fifteen hundred scattered and that was VFR."</i>
12:00:25	YQK FSS: <i>"Affirmative well, occasionally down to fifteen hundred broken after that time."</i>
12:00:30	GX 363: <i>"Okay we check that, we're down to about a mile and a half in Dryden in snow right now, quite puffy, snow, looks like it's going to be a heavy one. Uh, okay and go ahead with the rest."</i>

Time	Events
	Snow has increased in intensity. Visibility now down to 1 ½ miles (FO Mills's estimate) from 2 ½ miles at 1747Z.
12:00:44	YQK FSS: "Okay Winnipeg, valid from seventeen hundred, sky partially obscured, ceilings five hundred broken, one mile fog, variable five hundred scattered, ceilings four thousand broken, five miles fog, by twenty hundred, eight hundred scattered, ceilings four thousand broken, occasionally sky partially obscured, ceilings eight hundred broken, three miles in fog, and improving, well I don't know if improving after zero two hundred tonight, one thousand broken, four thousand broken, winds zero four zero degrees at ten, occasionally five miles light snow showers and a risk of a freezing drizzle, and ceilings tomorrow about fifteen hundred broken, stand by I'll see if there's any segmets [SIGMET] out for that area."
12:01:00	Mr Cochrane arrives in the cockpit with fuel figures. Captain asks if de-icing is available and Mr Cochrane says yes, it is, and points out Mr James Esh, who is walking by on the ramp, as the man who would do it. According to Mr Cochrane this is the end of the short conversation.
12:01:20	Mr Cochrane leaves the aircraft, and the door is closed. FO Mills has been completing the weight and balance form while the captain and Mr Cochrane are conversing.
12:01:30	FO Mills completes the weight and balance form. The door is already closed so he does not give the form to Mr Cochrane.
12:01:32	FO Mills calls FSS: "Okay we're just firing up here now and uh we'll give you a call requesting the IFR as well."
12:01:35	Before-start check – through flights (Piedmont F-28 Operations Manual); called by FO Mills and actioned by Captain Morwood.
	No Smoking and Seatbelt ON Instruments SYNC AND X-CHECKED Parking Brake SET Fuel ____Min, ____OB [On Board]

Time	Events
	Radios, Radar, Transponder . . . SET AND STANDBY
	TTC Switches (2) TAKEOFF
	Rudder and Aileron Trim CHECKED
	Papers ABOARD
	Thrust Index SET
	-----Cleared for Start-----
	Anti-Collision Lights ON
	Booster Pumps (4) ON
	Start Pressure ____PSI

[Note: This check should take about 60 seconds to complete.]

12:01:50 YQK FSS: "And 363 Kenora there is a segmet [SIGMET] out, correction, for Winnipeg area, radar shows reports confirm north to south line of scattered thunder cells, twenty miles wide from Bissett to Gretna moving eastward at forty-five knots, tops at twenty-eight thousand, severe clear icing and turbulence associated. That's about it."

No answer from flight 363. The pilots are probably busy starting the engine or reading check lists.

12:02:30 Crossbleed start (Piedmont F-28 Operations Manual); called by FO Mills and responded to by Captain Morwood.

CROSSBLEED START

If difficulties are experienced with APU air or an external air source with one engine running, a crossbleed start can be made. Prior to using this procedure, ensure that the area to the rear is clear. Increase thrust on the operating engine until there is a 30 psi duct pressure and use this air source to start the remaining engine.

CAUTION: A crossbleed start should not be attempted during pushback.

Engine Bleed Air Main Switches ON
 APU Bleed Air Switch OFF
 Throttle Lever ADVANCE
 Advance throttle lever on the operating engine until duct pressure reads 30 psi. Start remaining engine using normal procedures. After starter cutout, reduce power.

Time

Events

[Note: This check should take about 50 seconds to complete.]

12:03:20 After-start check (Piedmont F-28 Operations Manual); called by FO Mills and actioned by Captain Morwood.

AFTER START

Warning & Door Lights OUT
 Electrical GENERATORS ON CHECKED
 APU Air OFF
 Starter Master Switch OFF
 Air Cond. and Press BOTH ON, SET
 Anti-Ice AUTO/ON
 Pitot Heat ON
 HP Fuel Valve Levers OPEN
 Flight Control Lights OUT

[During or following this check the flaps are selected down and almost immediately back up. Flaps up would conform with recommended practice when taxiing on contaminated surfaces. Note: This check should take about 35 seconds to complete.]

12:03:43 YQK FSS: "Ontario 363 Kenora."
 Snow intensity continues to increase. Special weather observation taken about 1803Z (issued at 1806Z) shows precipitation ceiling at 300 feet above ground level (AGL) and visibility $\frac{3}{8}$ of a mile in moderate snow.

12:03:46 GX 363: "We're fired up, taxiing for departure requesting the airways to Winnipeg."

12:04:03 FHJS (Cessna): "There any chance that plane can hold, I'm having real bad weather problems here."

12:04:07 GX 363: "Okay three sixty three's, holding short of the active, be advised you are down to a half a mile or less in snow here."
 FO Mills confirms the MET observer's observation is still valid at 1804:07Z. Snow continues to accumulate on the wings; ramp is starting to build up layer of slush.

Time	Events
12:04:10	Captain Morwood calls Ms Brannan on radio and advises they have to hold for a light aircraft.
12:04:15	C-FHJS: <i>"That's a roger."</i>
12:04:31	C-FHJS: <i>"I'm about one mile south of the Airport."</i>
12:05:00	YQK FSS: <i>"Juliette Sierra Kenora, special VFR is approved in the Dryden control zone til one eight one five. Call final."</i>
12:05:05	Captain Morwood makes a PA announcement to the passengers, explaining the delay.
12:05:16	C-FHJS: <i>"We're on final."</i>
12:05:18	YQK FSS: <i>"Juliette Sierra Kenora, roger."</i>
12:06:22	GX 363: <i>"Kenora Ontario [three six three], we're taxiing out at this time, three sixty three Dryden, we check there's a single engine just landed here."</i>
12:06:42	YQK FSS: <i>"Are you using Runway one one or two nine?"</i>
12:06:46	GX 363: <i>"We'll go for 29."</i>
12:06:52	GX 363: <i>"Kenora you copy 363 taxiing for Departure 29."</i> Continues to snow heavily. Snow squall is heaviest at the 29 end of the runway (the east end of airport). Snow is becoming quite thick on the wings. Runway at the east end is building up slush and snow at the runway edges and, possibly, in the centre as well. <u>The contaminated runway procedures expected to have been followed by the flight crew of C-FONF</u> Taxiing: Most air carriers have their own procedures for taxiing on snow- and/or slush-covered runways. This usually calls for leaving the flaps up and delaying the Before Takeoff Checklist until in the vicinity of the threshold of the departure runway.
12:06:56	YQK FSS: <i>"363 Kenora stand by."</i>

Time	Events
12:07:24	YQK FSS: "Ontario 363 Kenora your clearance Sir."
12:07:33	GX 363: "Go ahead for three sixty three."
12:07:35	YQK FSS: "ATC clears Ontario 363 to the Winnipeg Airport, Dryden direct, maintain flight level two zero zero, departure Runway two nine, proceed on course, squawk code one three zero zero."
12:07:49	GX 363: "ATC clears 363 to the Dryden Airport, maintain to, uh Dryden direct maintain two zero zero off twenty-nine on course, thirteen hundred on the box."
12:07:56	YQK FSS: "Roger that was cleared to the Winnipeg Airport."
12:07:59	GX 363: "Affirmative, Winnipeg Airport."
12:08:24	YQK FSS: "Ontario three six three Kenora, call airborne time one eight zero eight, three-quarters (30 on T.I.U.)."
12:08:29	GX 363: "Call Kenora airborne three sixty three."
12:08:35	Taxi and Takeoff (Piedmont F-28 Operations Manual); called by FO Mills and responded to by Captain Morwood.

TAXI & TAKEOFF

Yaw Damper IN
Flight Controls CHECKED
Flaps
Stabilizer Trim UNITS UP/DOWN
Liftdumpers ARMED, RDY
Collector Tank Indicators BLACK
Control Cabin Door LOCKED
Shoulder Harness SECURED
Takeoff Data and Brief REVIEWED, BUGS SET

[Note: Approximate elapsed time 40 seconds to complete this check.]

Time	Events
	<u>Cleared For Takeoff</u>
	APU ON/OFF
	Flight Att. Advisory GIVEN
	Transponder ON
	<u>Engine anti-icing during ground operation and takeoff.</u>
	Engine inlet icing may occur at a temperature above freezing when there is no evidence of icing on the aircraft. Switch on engine anti-icing after engine start when icing is observed or anticipated, i.e., when the ambient temperature is below +10°C and visible moisture (rain, slush, snow, fog, etc.) and/or wet runways exist. To check engine anti-icing pressure controlling in the range 45 to 57 psi, HP rpm may be momentarily increased during taxiing.
	<u>CAUTION:</u>
	IN FOG AND RAIN AT TEMPERATURES BELOW +10°C THE ENGINE ANTI-ICING SYSTEM MAY NOT BE CAPABLE OF KEEPING THE ENGINES CLEAR OF ICE DURING PROLONGED TAXIING AND/OR LONG PERIODS OF IDLING. IN THESE CONDITIONS IT IS RECOMMENDED TO ACCELERATE THE ENGINES TO APPROXIMATELY 90% HP ROM FOR 3 TO 4 SECONDS AT INTERVALS OF NOT MORE THAN 8 MINUTES. BEFORE COMMENCING THE TAKEOFF ROLL, SELECT TAKEOFF POWER ON THE BRAKES TO CHECK SATISFACTORY ENGINE BEHAVIOUR.
	Aircraft turned around at the button of Runway 29, and engines run up apparently in accordance with the above procedures, prior to brake release.
12:09:29	GX 363: <i>"And Kenora Dryden Ontario three sixty three, is about to roll twenty-nine at Dryden."</i>
12:09:35	YQK FSS: <i>"Ontario three six three Kenora, roger."</i> Snow intensity is decreasing slightly. Special observation taken at 1809Z (issued at 1211Z) gives precipitation ceiling of 1000 feet AGL and visibility of $\frac{3}{4}$ of a mile in snow.
12:09:35	Short engine run up

Time	Events
12:09:40	<p>Aircraft begins takeoff roll.</p> <p>Takeoff: The aircraft was equipped with standard chined nosewheel tires. A flap setting of 18° is recommended, thereby eliminating possible trapping of slush between vane and flap during retraction after takeoff. The takeoff is based on $V_1/V_R=1.0$ to avoid the possibility of insufficient acceleration after engine failure.</p> <p>It is recommended to raise the nosewheels out of the slush as soon as the elevator becomes sufficiently effective and to continue acceleration with the nosewheels just clear of the slush. Thereby the contribution of the nosewheels to the total slush drag is eliminated. However, care should be taken not to over-rotate, as this would increase the aerodynamic drag.</p> <p>At V_R commence rotation to approximately 10° nose-up pitch and continue the takeoff in the normal manner. <u>CAUTION</u>: SLUSH DRAG PRODUCES SIGNIFICANT NOSE-DOWN PITCHING MOMENTS. THE SUDDEN REDUCTION IN DRAG AT THE MOMENT OF ROTATION MAY RESULT IN OVER-ROTATION.</p>
12:09:56	Aircraft reaches 80 knots. This is the speed where captain is committed to take off unless an engine fails before V_1/V_R .
12:10:45	Aircraft crashes in bush 950 metres west of the runway.
12:10:54– 12:12:45	<i>Kenora FSS asks Winnipeg ATC if it has contact with Air Ontario 363. The FSS and ATC both try to locate the aircraft and then Kenora FSS speaks with CFR Chief Ernest Parry, who is in Red 3 on the runway at Dryden.</i>
12:12:47	<i>Chief Parry tells Kenora FSS that aircraft may have gone down west of the airport.</i>
12:14	<i>Chief Parry informs town dispatch and asks that emergency plan be activated.</i>
12:18	Chief Parry in place at McArthur and Middle Marker roads.

Time	Events
12:19	Red 1 arrives at end of Middle Marker Road. CFR crew chief Stanley Kruger takes his portable radio and first-aid kit and proceeds to crash site.
12:24	<i>Command centre in town is set up and ready for requests.</i>
12:26	<i>Chief Parry calls for pumper from town.</i>
12:27–28	<i>Chief Parry asks airport to send field maintenance “guys” and “at least a loader.”</i>
12:29	<i>Chief Parry asks if any ambulances are available.</i>
12:30	Sergeant Douglas Davis of the OPP arrives at McArthur and Middle Marker roads.
12:32	<i>Chief Parry reports “twenty/twenty-five walking wounded” out at road.</i>
12:34	UT of O Rapid Attack truck arrives and parks on McArthur Road.
12:35	<i>First ambulance arrives and drives down Middle Marker Road to where Red 1 is parked. From a comparison of all other available information, it appears that the clock in the TACH unit in unit 644 was about nine minutes fast. The TACH unit says it arrived at the site at 12:44 p.m., but Chief Parry reports that the ambulance arrived at the site at 12:35 p.m.</i>
12:40	UT of O tanker truck arrives and parks on McArthur Road.
12:43	Red 2 arrives and drives down Middle Marker Road. Shortly thereafter, it backs out to allow the ambulance to depart. Red 2 loses the air in the brake system and is parked on McArthur Road.
12:44	<i>Two Town of Dryden fire trucks arrive at Middle Marker Road.</i>
12:45	UT of O fire chief Roger Nordlund arrives at McArthur and Middle Marker roads.

Time	Events
12:46	<i>The number of people on board C-FONF is confirmed at 69 in a radio communication from Peter Louttit, manager of Dryden Municipal Airport, to Chief Parry.</i>
12:52	<i>Chief Parry advises that "5 or 6 private vehicles and police cars" have left the site for the hospital with survivors. This is in addition to unit 644, which departed the site at 12:51 with seven survivors.</i>
12:55	<i>Ambulance unit 645 – Sandra Walker – arrives at site carrying supplies and bringing Dr Gregory Martin and Dr Alan Hamilton. Ms Walker is the emergency medical care attendant.</i>
1:05	<i>Ambulance unit 645 departs site with Mrs Nancy Ayer for hospital.</i>
1:08	<i>Dryden Fire 5 on a portable from the site advises that all survivors are out to the road.</i>
1:10	<i>Crew chief Kruger confirms that all survivors are out and remarks, "We need a road in here badly and if we can get some handlines in here somehow."</i>
1:11	<i>Chief Parry calls for a heavy dozer to punch a road to the site.</i>
1:12	<i>Crew chief Kruger advises, "We have got two more survivors ... we pulled out of the wreckage." These survivors are Mr Michael Kliwer and Mr Uwe Teubert. A discussion ensues about getting a helicopter to land at the site to take out these two remaining survivors. It is concluded that it will take too long for a helicopter to arrive, and the two men are carried out of the bush.</i>
1:30	<i>Some time after 1:30, the two UT of O fire trucks are driven down Middle Marker Road and set up for fire suppression.</i>
1:37	<i>Ambulance unit 645 returns to the site.</i>
1:45	<i>Ambulance unit 645 departs the site with Mr Kliwer, Mr Teubert, and Dr Martin.</i>

Time	Events
2:00	First foam is applied to the burning aircraft.
2:00	<i>Ambulance unit 645 arrives at Dryden hospital.</i>

Notes to Time Sequence

- 1 The time sequences are based on the assumption that all required checks were carried out by the pilots.
- 2 All times are local.
- 3 All the evidence has been considered with respect to weather data for the various times. Some of this evidence is conflicting. In an attempt to resolve contradictions, more reliance was placed on the evidence of trained observers than on the evidence of untrained observers. In this context, professional pilots are considered trained observers.
- 4 The times that are accurate are:
 - (a) The radio transmissions between GX 363 and Kenora FSS. First Officer Mills makes all the calls to FSS. Captain Morwood makes the calls to Dryden Flight Centre.
 - (b) The telephone call from Captain Morwood to the SOC centre in London.
 - (c) Times obtained from the Dryden and airport fire channel tape.
 - (d) Ambulance tachographs (adjusted).
- 5 The times noted as normal for completion of the cockpit checks take into consideration the relatively low experience level of the two pilots on the F-28.
- 6 There is an assumption that the taxi speed was normal.
- 7 Except where noted, all event times following the takeoff of the aircraft are taken from the Kenora FSS tape, the Dryden and airport fire channel tape, or the ambulance tachographs.

Appendix H

Summary of Fatalities and Survivor Injuries

Summary of Fatalities in Crash of Flight 1363

Seat	Name	Cause of Death
A	Morwood, George John	Gross blunt force trauma including ruptures of the heart
B	Mills, Keith B.	Smoke inhalation and presumption of blunt force trauma to abdomen
C	Say, Katherine	Generalized body burns
1a	Allcorn, Don	Generalized body burns
1b	Kliewer, Pamela	Generalized body burns
1c	Kliewer, Brian	Multiple trauma, severe head injury, and terminal aspiration of blood
1d	Syme, Steve	Generalized body burns
2b	Kliewer, Lisa	Multiple trauma, CO 21%
2c	Kliewer, Michael	Massive trauma
2d	Rabb, Hilda	Burns to body
3a	Kozak, Ryan	No anatomic cause of death (grave destruction of body)
3b	Kozak, George	Undetermined (charred body with fractured femoral shafts)
3c	McLeod, Kenneth John	Trauma

Seat	Name	Cause of Death
4a	McColeman, Wilfred P.	Undetermined
4b	McColeman, Geraldine	Trauma with terminal aspiration of blood
4c	Gallinger, Fred	Trauma
5a	Monroe, Mark	Traumatic injury with terminal aspiration of blood, CO 15%
5b	Schweitzer, William	Traumatic injury
5c	Rossaasen, Alvin	Smoke inhalation and burns to the body, CO 65% – lethal range
6a	Finlayson, Donald	Smoke inhalation, CO 23%. No anatomic cause detectable.
6b	Fortier, Wendy	Smoke inhalation, toxic CO 33%. No anatomic cause detectable.
6c	Fortier, Greg	Soot in airway, CO 21%. No anatomic cause of death.
7a	Barton, Rudy	Undetermined (charred body)
7c	Ayer, Nancy	Extensive full-thickness cutaneous burns and hypovolemic shock

Summary of Injuries

Seat	Name	Documented Injuries
1e	Syme, Karen	Hospitalized. Grief reaction and superficial laceration to scalp.
2a	Teubert, Uwe	Hospitalized. 2d and 3d degree burns to back. Lacerations of L face, chin, and L thigh requiring suturing. Abrasions and bruising to chest, lower limbs, and R buttock. Loss of consciousness and concussion. Smoke inhalation.
2c	Kliewer, Michael	Hospitalized but FATAL. Massive trauma and skull fracture.
2e	Phibbs, Jack	Hospitalized. Abrasions to L flank. Bruising of L shoulder. Fractured R thumb. Significant head injury with questionable concussion. Preponderance of L-sided injuries.
3d	Waller, Richard	Hospitalized. Abrasions to forehead and legs. Significant impact and bruising to L shoulder and L chest wall. Physician worried about a ruptured spleen. Chip fracture of L lateral epicondyle. Preponderance of L-sided injuries.
3e	Ditmars, Clyde	Bruising and abrasions to L leg, forehead, nose, and L ribs. Sprained L ring finger. Preponderance of L-sided injuries.
4d	Adams, Brian	Hospitalized. Laceration to R palm and L thumb requiring sutures. Bruising and abrasions to L leg, ankle, and L eye. Preponderance of L-sided injuries.
4e	Perozak, Brian	Bruising to L shoulder and L leg. Preponderance of L-sided injuries.

Seat	Name	Documented Injuries
5d	Haines, Shannon	Laceration to R leg. Abrasion to L leg. Bruising to forehead and L leg.
5e	Archer, John	Abrasions to scalp and hands. Bruising to anterior chest.
6d	Tucker, Gordon	Bruising to R chest and L forearm. Sore neck and R chest.
6e	Maronese, Tina	Abrasions to L foot and bruising to L flank, chest, and scapula. Slight preponderance of L-sided injuries.
7b	MacDougall, Allan	Hospitalized. 3d degree burns to R foot, back, and L shoulder involving 6% of body surface area. Laceration to L forehead. Bruising to L hip. Fracture of L forearm (radius). Preponderance of L-sided injuries. Questionable loss of consciousness. Smoke inhalation?
7c	Ayer, Nancy	Hospitalized but FATAL. Extensive full-thickness cutaneous burns and hypovolemic shock.
7d	Campbell, Ricardo	2d degree burns to face, head, and shoulders involving 5% of body surface area. Lacerations and bruising of L leg.
7e1	Podiluk, Shelley	Hospitalized. 1st degree burns to hands. 2d degree burns to midback, groin, and feet. 9% of body surface area affected by burns. Sore neck and chest. Significant hyperflexion/extension neck sprain noted. Questionable 3rd degree sprain or avulsion fracture of L lateral talofibular ligament (L ankle). Bruising to occiput. Likely smoke or fume inhalation.

Seat	Name	Documented Injuries
7e2	Podiluk, Megan	Hospitalized. 2d to 3d degree burns to 3% of body surface area. No smoke or fume inhalation. Small laceration of the scalp.
8a	Harris, Tom	Hospitalized. 1st and 2d degree burns to L hand, forearm, elbow, and shoulder, and R hand and forearm. 14% of body surface area affected by burn.
8b	Knott, Byron	Hospitalized. Bruising and abrasions to head and body. Dislocated R elbow. Sprained R back.
8c	Mandich, Ron	1st degree burn to face with singed hair. Sore neck and sprained L wrist.
8d	Hartwick, Sonia	Bruising and abrasions to R forehead. (Also diagnosed skull fracture.)
8e	Taggert, Paul	Bruising and abrasions to wrists, face, R knee, and L ribs
9a	Godin, Lori	Abrasions to R lateral knee. Sore neck and R collarbone.
9b	Godin, Dan	No emergency reports. Likely not treated for any injuries.
9c	Bertram, Alfred	Abrasion to L wrist and R chin
9d	Godin, Susan	Bruising and abrasions to R lower waist. Sore neck.
9e	Godin, Danielle	Bruising and sprained/strained back. Conjunctivitis of R eye.

Seat	Name	Documented Injuries
10a	Menzies, Donna	Hospitalized. Sprain/strain to lower back but walked out of woods.
10b	Mackenzie, Kelly	Bruising to L hip, thigh, and parietal area of the head. Abrasions to R wrist.
10c	Mackenzie, James	Bruising and abrasions to R shoulder, hand, and calf
10d	Ferguson, Susan	Hospitalized. Laceration to L scalp requiring 5 sutures. Bruising and abrasions to legs. Admitted for observation.
10e	Ferguson, Michael	Superficial laceration to the L scalp and lower lip. Bruising to R upper arm and R lower leg.
11a	Gatto, Michael	Bruising to shoulder, waist, and L lower leg
11b	Gatto, Ryan	No injuries, just shaken up
11c	Haines, Lois	Hospitalized. 1st to 3d degree burns to both legs and 10% of body surface area. Bruise to R posterior chest, face, and temple with questionable LOC. Sore neck. Laceration of L ankle requiring 4 sutures.
11d	Woods, Violet	Hospitalized. Laceration to L forehead. Bruised periorbital area, R shoulder, and scapula. Dislocated L foot tarsal joint.
11e	Biro, John	Hospitalized. 2d degree burns to scalp. Laceration to lip and R ear requiring sutures. Sore neck. Admitted for concern over past cardiac problems.

Seat	Name	Documented Injuries
12a	Berezuk, David	Hospitalized. Bronchospasm and wheezing secondary to cold exposure or fumes. Laceration to R face needing sutures. Abrasions to R arm, face, and legs. Minor injuries but hospitalized.
12b	Berezuk, Michael	Abrasions to R leg
12c	Berezuk, Sandra	Superficial laceration R forearm, both legs and hips. Fractured R 9th posterior rib.
12d	McFarlane, Douglas	Hospitalized. Fracture L ribs #2, 3, and 4 which resulted in a mild haemothorax. Fracture and dislocated L ankle. Bruising to R frontal scalp, forehead, L flank, R lower thigh, and knee. Preponderance of L-sided injuries.
12e	McFarlane, Gary Scott	Laceration of R lower leg and L knee requiring sutures. Sprained R ankle. Bruise to head. Abrasion to shoulder.
13a	Jackson, Gary	1st and 2d degree burns to both hands. Laceration and puncture of L ear. Abrasion of L leg.
13b	Crawshaw, Donald	Burned or singed hair. Superficial laceration of nose. Sprained L wrist.
13c	Swift, Dennis	Hospitalized. Open compound comminuted fracture of R femur. Abrasions to the face and bruising to the L thigh.
13d	Haines, Murray	Bruise to hip and back
13e	Haines, Jessi	No significant injuries

Appendix I

Minutes of Debriefing Meetings, Town of Dryden, March 13 and 16, 1989

DISTRIBUTE IN ENVELOPES MARKED CONFIDENTIAL:

THE CORPORATION AT THE TOWN OF DRYDEN

March 13, 1989

Minutes of a debriefing meeting held at 10:00 a.m. on the above date in the Boardroom of the Town Hall.

Present: Mayor Jones, Airport Commission Chairman D. McDonald, Fire Chief L. Maltais, Project Engineer T. McConnell, Construction Superintendent W. Yasinski, Deputy Fire Chief D. Herbert, Welfare Administrator D. Smith, Treasurer P. Heayn, Administrator J. Callan, Telephone Manager W. Greaves, Police Chief R. Phillips, Town Engineer M. Fisher, Clerk B. Hoffstrom, Office Staff: G. Odell, E. Boyce, M. Wiedenhoeft, E. Realini.

Chief Maltais chaired the meeting and announced the purpose of the meeting was to review any problem areas which arose during activation of our Emergency Plan following the crash around noon on Friday, March 10th of an Air Ontario F-28 jet. The aircraft was fully loaded and carried a total of 69 crew and passengers. There were 45 survivors and 24 fatalities. Chief Maltais noted that discussions at this meeting are confidential to those in attendance. He then requested each person to give individual comments.

TOM MCCONNELL reviewed his activities in the plan and indicated that the operation appeared to be well organized from his point of view.

WILL YASINSKI reviewed the Public Works activities, noting that diaries were maintained at the Public Works office of communications received and dispatched, noting that it was difficult in the early stages to convince people that this was not a practice. He noted a small problem with the portable power plants which were obtained at Canadian Pacific Forest Products in that the plants were available but there was no lighting to go with them. He noted also that Ontario Hydro and Bell Canada have portable generators but they are not on our

contact list. They also have snowmachines and should be on our list. There was discussion on whether the power plants should be stored on our site or at Bell or Ontario Hydro, and if they are, we should have the name of a contact person for access after regular working hours. He noted Public Works would be holding their own debriefing later today.

DARRYL HERBERT advised that his pager did not alert him, instead he went to the Fire Hall on his own volition after hearing something on the radio. He noted his involvement was primarily in assisting the Fire Chief. Also, all but four firemen, who are out of town, responded to this emergency. Firemen will be debriefing tonight.

GLENNA ODELL indicated she had a rather hectic ride to the hospital, also that proper forms were not initially available at the hospital. After Maurette arrived with the proper documentation, etc., there appeared to be very little problem.

ESTHER BOYCE acted as secretary at the Emergency Operations Centre. She commented on the excess of unnecessary people in the EOC, and suggested that the Red Cross should have a representative on the Control Group. Another suggestion was that the media people should be kept out of the control room.

LOUIS MALTAIS suggested that everyone involved in this event should do a personal diary on the extent of their involvement. He noted also that there was a need for a designated code so that people involved are able to determine that a real emergency is not a practice.

MAURETTE WIEDENHOEFT reported on communication problems with the Red Cross, the frantic ride to the hospital, the fact that we should have purchased toys or books or something for the children to keep them occupied, the need to ensure that an internal plan is developed for all departments, and she recommended that more employees attend the Arnprior training centre.

DOROTHY SMITH commented on the conflict with the Red Cross and their involvement in registering people. She also expressed concern with the operations of the media at the motels noting they should be controlled better by the Police Department, and noting that more police are required in that regard.

PAUL HEAYN noted that Ken Rentz was helpful in preparing a meeting place for relatives of the victims in the basement of the United Church.

He noted we should ensure there is a good supply of body bags on hand at all times, also that the ID badges need updating.

ELSIE REALINI reported on the co-operation she received from local merchants, particularly The Bay. The personal hygiene bags prepared for the injured people were very much appreciated. It was suggested an information package on Dryden complete with paper and pen be available for distribution to injured people in such circumstances as most of them are unaware of very much of what is available in Dryden. With respect to the hospital activities, she noted there was some duplication of information being requested from the victims and this was somewhat of a problem, particularly as time went by and the injured became more anxious and tired, etc. She also expressed a concern with people ending up totally alone in a motel room after such a harrowing experience.

WALTER GREAVES noted the importance of having telephones installed well in advance as much as practical because if telephone installers are required, it reduces the fire crew by up to three people. He was not aware of any other particular problems with communications. It has been suggested that the telephones in our EOC should have a hold button so that if it is necessary to have a caller wait for some information, the room noise is not picked up by the receiver. It was also suggested that large numbers indicating the telephone number of each phone be positioned above the phone location so that it is readily visible from all points in the room.

RUSS PHILLIPS commented on a number of problems, including the OPP role and how it fits in with our plan, communications in general between the control group and the outside world, ordering of supplies, fuel, medical services, media releases. He suggested we file our Town Emergency Plan in Kenora for their information. He suggested some of the roles in our Plan require clarification. Also the media should have a room separated from the EOC, and the control room made more secure. He advised that, in the future, Nancy Murdick will be involved at the outset of any emergency and will act as the scribe. He also suggested that telephones be installed on a permanent basis in the control room.

MEL FISHER noted he requires two copies of the Emergency Plan, and he suggested there should be maps available of the whole area surrounding the town rather than maps only of the town itself. He agreed the control centre requires greater security, and suggested there was a possible need for radio communications with all departments.

JOHN CALLAN advised he thought the people involved had functioned well and while the control centre facility had certain inadequacies, it was much better than the centre utilized for the November exercise. He agreed with the comments made earlier with respect to separation of the media by providing a separate room for them, however he noted that the use of Hugh Syrja for dealing with the media appeared to work well. He commented on the problems with the Red Cross with respect to their role, their relationship with our plan, the need for badges for on-site workers and/or arm bands, the conflict over role and authority with the OPP, the excellent co-operation received from the Ministry of Natural Resources, and the problems experienced in controlling the media on Saturday at the Lenver Inn. He indicated that letters of commendation would be sent to various individuals.

BRUCE HOFFSTROM concurred with the concerns raised with respect to the security for the EOC in particular and with the other concerns in general.

DICK MCDONALD commented on his activities and involvement with this event. In his opinion, the plan was well organized and well executed. He commented on the coincidental availability of the Hercules and the mid-flight change of plans to pick up experienced staff in Winnipeg.

LOUIS MALTAIS indicated there was a problem with the initial alert being placed by radio as this immediately alerted anybody operating a scanner. Future alerts are proposed to be by telephone. With respect to media, he suggested there should be both press and radio involved with press releases to be issued through the Administration. A communications problem resulted when people and equipment directed to specific locations did not confirm to the control group when they had arrived at these locations. He commented on the chain of command and noted this nearly fell apart a couple of times and that it must be maintained in order to avoid chaos. He suggested there should be one spokesman in the control centre for each major organization involved, i.e. Red Cross, etc. He noted the need for telephones on a permanent basis and for maps covering the area at least 10 kilometers surrounding town. He advised that Andrew Skene has arranged for a psychological team to be in Dryden to deal with workers if it is required.

He advised a debriefing has been scheduled for 2:00 p.m., Thursday, March 16th, 1989 involving all the resource agencies and people involved, to be held in the basement of the Anglican Church. Coffee and sandwiches will be available.

He commented on the ID badges and the need to have them updated and, in some cases, badges are not sufficient. There is a necessity for civilians to be provided with armbands which clearly indicate they are representing the Town of Dryden Emergency Group and perhaps their designation.

TOMMY JONES commented on our plan and on the coincidental meeting held Friday morning just before the crash. He noted that the internal plans are supposed to be updated by April 15th. He noted as well that the crash did occur beyond our jurisdiction outside the town limits and beyond the airport, and our involvement in the plan was to act as an evacuation centre to help and assist the injured.

He suggested that when our plan is revised, it should include detailed responsibilities, including delegation of the roles, definition of responsibilities, for at least three levels downward when people are away. We were fortunate this time that nearly everyone was present and available.

He noted that the letters of commendation referenced by Mr Callan should be sent to the individuals' superiors as well as to themselves.

He suggested there should be a special phone number for the plan co-ordinator so that in the event of an exercise or a real emergency an attempt can be made to contact the co-ordinator. He then philosophized on emergency planning in Dryden, particularly with respect to our vulnerability due to the Canadian Pacific Forest Products function, the CPR, the Trans Canada Highway, etc.

In closing, he extended his compliments to all on a job well done.

PAUL HEAYN asked that all invoices for expenses related to this occurrence be processed as quickly as possible.

Meeting adjourned at 11:40 a.m.

Following adjournment, the Emergency Control Group met to review the arrangements for the general debriefing to be held Thursday, adjourning at 12:00 noon.

Source: Exhibit 37

* * *

THE CORPORATION AT THE TOWN OF DRYDEN

March 16, 1989

Minutes of a debriefing meeting held at 2:00 p.m. on the above date in the basement of the Anglican Church.

Present:

Louis Maltais	Fire Chief	Dryden
John Callan	Administrator	Dryden
Bruce Hoffstrom	Clerk	Dryden
Bob Mitchell	District Manager ICG	Ignace
John Hyndman	Secretary, Dryden Ministerial Assoc.	Dryden
Walter Greaves	Dryden Telephone	Dryden
Russ Phillips	Police Chief	Dryden
Dick McDonald	Chairman, Airport Commission	Dryden
Tom Varga	Sergeant, OPP	Dryden
Maxine Moulton	Direct of Nursing, Hospital	Dryden
Harold Rabb	Dryden Ambulance	Dryden
Carl Eisener	Chief of Staff, Hospital	Dryden
Andrew Skene	C.E.O., Hospital	Dryden
Mel Fisher	Town Engineer	Dryden
Robert L. Rolls	Rector of St. Luke's	Dryden
Peter Louttit	Airport Manager	Dryden
Ernie Parry	Chief, Crash Fire Rescue	Dryden
Ken Bittle	V.P. Maintenance, Air Ontario	Dryden
Bill Deluce	President, Air Ontario	Dryden
H.H. Sampson	Regional Director, Emerg. Preparedness	
Major Don Christie	Central Region Operations, Dept. of National Defence	
Marleen Griffiths	Emergency Planning Ontario	
Jim Ellard	Deputy Co-ordinator, Emergency Planning Ontario	
Des. Risto	Emergency/Disaster Co-ordinator, Transport Canada	Winnipeg
Roger Nordlund	Fire Chief, UT of O	Wainwright
Hugh Syrja	Manager, CKDR	Dryden
Trevor Woods	Program Manager, Fire Manager, Ministry of Natural Resources	Dryden
Len Suomu	Chief Forester, Canadian Pacific Forest Products	Dryden
Ted Broadhurst	Mill Manager, Canadian Pacific Forest Products	Dryden
Gerry Ferguson	Director of Recreation	Dryden

Archie McNeil	Office Manager	Dryden
Craig Nuttall	Councillor	Dryden
Carl Bleich	President, Red Cross	Dryden
Vic Kameda	Facility Superintendent	Dryden
Dorothy Smith	Welfare Administrator	Dryden
Paul Heayn	Treasurer and Deputy Clerk	Dryden
Ken Rentz	Emergency Representative, Amateur Radio	Dryden
Tom Hinton	Director of Investigation, Canadian Safety Aviation Board	Dryden
Maj. Jim Armour	Accident Investigator, Canadian Safety Aviation Board	Dryden
Const. Klaus Larsen	Identification Officer, City Police	Thunder Bay
Det. Sgt. J. Bolduc	Criminal Investigation Div., Police	Thunder Bay
Allan Slota	Emergency Services, Red Cross	Dryden
Will Yasinski	Construction Superintendent	Dryden
Ken Kurz	Captain, Volunteer Firefighters	Dryden
Randy Smith	By-law Enforcement Office E.M.O.	Keewatin
Darold Anness	Canadian Pacific Forest Products	Dryden
Art Burnell	General Hospital	Sioux Lookout
Sylvia Arkeson	Director Nursing Service	Sioux Lookout
John Coagie	Chief of Security, Canadian Pacific Forest Products	Dryden
Raymond Godfrey	Lieutenant, U.T.of O.	Dryden
Ralph Fulford	Fire Chief	Fort Frances
Gary Rivard	CFR	Dryden
Fred Bouter	Ex Staff Officer, Flight Crew Training Fokker Aircraft	
John Albanese	Councillor	Fort Frances
Jack Murray	Police Chief	Fort Frances
Nancy Murdick	Secretary, Police Force	Dryden
Joe Abela	Communications Supervisor, Ministry of Natural Resources	Dryden
Dave Wessel	President, Amateur Radio Society	Dryden
Dave Beasiey	Laverendrye General Hospital	Fort Frances
Constable Brent Black	Police Force	Kenora
W.F. Beatty	Public Affairs Manager, Canadian Pacific Forest Products	Dryden
J.A. Riley	Security Assistance	Dryden
Tim Eady	Hydro Superintendent	Dryden
Mario Facca	Captain, Fire Department	Sioux Lookout
Darryl Herbert	Deputy Fire Chief	Dryden
Ed White	Deputy Fire Chief	Kenora
D.J. Milliard	Firefighter	Kenora
F.C. Harvey	Inspector, OPP	Kenora

Mayor Jones opened the meeting by calling on Canon Robert Rolls for a prayer. Following this, Mayor Jones introduced selected individuals and called on all others to stand and be identified. He welcomed all present to this meeting, announcing that the purpose of the meeting was to review any problem areas which may have arisen with respect to the implementation of the Dryden Emergency Plan following the crash shortly after 12:00 noon on Friday, March 10th of an Air Ontario F-28 jet. He then turned the meeting over to Fire Chief and Emergency Planning Co-ordinator Louis Maltais.

Fire Chief Maltais indicated that each individual involved would have an opportunity to speak and comment on any areas of concern which had come to their attention.

The following comments were received:

- | | |
|---------------|---|
| PETER LOUTTIT | - Responded in his own vehicle (has no FM radio) had trouble finding control centre number - had some confusion as to who was "Fire No. 1" (control centre) - suggested there is a need for a radio identifier for the centre. |
| ERNIE PARRY | - Made his first call to the Police Dispatcher - received calls from "Fire No. 1" (confirmed need for a radio identifier) - had no difficulty working with Emergency Control Centre (ECC) personnel. |
| MAYOR JONES | - Suggested that individuals speaking identify any weaknesses they found in their own plan or in the overall plan. |
| PETER LOUTTIT | - Indicated there had been minor deficiencies with the airport plan, but only with the identification of Fire No. 1 with the Town plan. |
| CANON ROLLS | - Problems getting a phone line at the hospital - no means of communication except for Fax - supports the use of ham operators - problems with the media attempting to obtain information from victims at the hospital and at the Lenver Inn. |
| REV. RENTZ | - With respect to the ham operators, noted they had forgotten to have a local direct long distance set up put in place. |

- MEL FISHER
- Noted he had a peripheral relationship with the ECC – needs a direct line between Public Works and ECC – need for a dedicated room for an ECC – problem with using the firemen's room, public infiltration, etc. – noted the need for detailed area maps with current information, and fixed in position on the walls – noted the need to order heavy equipment (ie D8 bulldozer) early, particularly in cold weather due to warm up time required.
- ANDREW SKENE
- Had trouble contacting ECC due to telephone lines being jammed – suggested a Fax machine in the ECC – noted that worldwide media coverage on air crashes is much greater than he had expected, and more planning is required in this regard – noted there were 37 active beds at the hospital, and if there had been more casualties, the capabilities of the hospital would have been correspondingly reduced – responded that the hospital had been aware of the availability of the Hercules ambulance aircraft and in at least four different conversations from the hospital, had advised the Hercules was not required.
- KEN BITTLE
- Gave general comments, details not available.
- DR. EISENER
- Noted the impact of the media and the need for some control and guidelines – gave accolades to Town workers and volunteers, noting the same remarks had been made from certain media.
- HAROLD RABB
- Noted ambulance service had no particular problems – responded that maybe 25 patients had been moved by private vehicles – responded that the impact of using private cars increased the intensity of the work load at the hospital but there were, in fact, 12 doctors on hand – reported two doctors went to the accident site leaving 10 at the hospital – noted this may not always be an option – responded that, in his opinion, conditions at the accident site

appeared to be well under control – noted he was the third vehicle to arrive and that capable direction was being given by Ernie Parry.

- MAXINE MOULTON – Confirmed the problem with communications – noted there was no idea of the passenger capacity of the aircraft from the designation – “F-28-” (most civilians aren’t familiar with this information) – hospital was not given any idea of the number of patients.
- ANDREW SKENE – Commented the Red Cross was a great help in keeping track of names.
- INSP. HARVEY – Extended compliments to all workers involved – noted his primary concerns were with onsite security, search and rescue, locate and identify – noted 58 OPP officers were on site – indicated no particular problems other than those with the media.
- REV. RENTZ – Expressed concern that the media had tied up the telephone at the airport.
- CARL BLEICH – Commented on the good co-operation received from the OPP Sergeant Munn – recommended the OPP obtain a Fax machine.
- PETER LOUTTIT – Commented on the tight security and that there was very little unnecessary traffic or spectators.
- INSP. HARVEY – Expressed concurrence on the remarks on the need for a Fax for the OPP and noted this would be looked into – responded that he did not think there had been any duplication of communication – indicated the helicopters had been engaged by the media and this did create a problem which interfered with police communications due to the noise as the helicopter were hovering over the crash site.

- REV. RENTZ – Commented that in his opinion, the common frequency is the best way to maintain communications.
- SGT. VARGA – Noted it was optional for Dryden to become involved in an incident which occurred off the airport site and commended all involved for their excellent participation – commented on the C130's which although were not required at this time, should be kept in mind in the event of a future need.
- JOHN CALLAN – Commented that he had ordered the helicopters which, as it turned out, were not required at this time.
- ERNIE PARRY – Noted that helicopter pads had been constructed at the hospital.
- DICK MCDONALD – Commented briefly on his activities and involvement at the crash site noting he had taken one roll of photographs and turned the prints over to the authorities.
- CHIEF PHILLIPS – Noted his first contact was to Andrew Skene at the hospital and the district headquarters of the OPP – commented on the role of the OPP in our emergency plan and the relationship with the Emergency Control Group, the Dryden Police Force – suggested there was some overlap which needs to be addressed – provisions should be made for the Police Dispatcher during events of this nature as the regular work goes on – there should be a way to shorten the length of transmissions, i.e. 10 codes – facilities should be twinned so that an extra operator can be brought in to handle the emergency situation, leaving the other to handle the regular business – the communications process requires further clarification and definition – ham radio operators should be used as much as possible – it may be that additional telephone lines are required and the telephone sets should have a hold button on

them – there should a direct line from the Emergency Control Centre to the police office – he will be taking his own personal scribe with him to the next incident – media should be in a separate room – Hugh Syrja should be identified as the media officer in our emergency plan.

- | | |
|----------------|---|
| INSP. HARVEY | – Agreed with the need for a personal scribe and control of the media – agreed with the need for improvements and clarifications of roles, details, with respect to the role of the OPP and how it is involved in the Dryden Emergency Plan – apologized for the removal of the ham operator away from the site by the OPP – agreed with the suggestion that proper identification of such volunteers to demonstrate their right to be present would facilitate operations at the site. |
| ERNIE PARRY | – Noted ham operators are new in our emergency plan – a good idea but it didn't work at the site for himself, needs some refining – confirmed the need for individuals to have a scribe at hand, he could have used one but didn't have one. |
| CHIEF MALTAIS | – Confirmed scribes would be available next time for those who need them. |
| PETER LOUTTIT | – Confirmed the aircraft had departed the airport at 12:09 p.m. |
| ERNIE PARRY | – Noted that communications with helicopters at the site was a problem. |
| CHIEF PHILLIPS | – Commented the problem we had was that there were too many people trying to speak on the frequencies and very often whole transmissions had to be repeated – there appears to be a need for some separate channels or implementation of 10 codes. |

- PETER LOUTTIT – Questioned the purpose of a specific frequency and how this could be implemented.
- CHIEF PHILLIPS – Commented on how the media picked up everything on the 2-way radios, perhaps “voice guards” should be used – confirmed the need to keep transmissions concise and brief or alternatively implement use of 10 codes.
- WALTER GREAVES – Noted telephones had been installed at the ECC by 12:35 p.m. – suggested discussions be held with the hospital and any other organization that may require additional telephones in the event of an emergency so that plans and strategies can be developed in advance.
- REV. HYNDMAN – Confirmed the shortage of telephones at the hospital and expressed commendations for the hospital staff.
- CANON ROLLS – Commented on the arrangements made for relatives of victims at the First United Church but there was no list of names made available.
- BOB MITCHELL – Noted he was involved in a stand-by role only, however equipment is available through ICG i.e. snowmachines, helicopters, etc.
- INSP. HARVEY – Commented on the problem with helicopters at the scene due to the low ceiling and the actual site of the accident well off the end of the runway.
- ANDREW SKENE – Responded to previous remarks that it was fortunate there were few Dryden residents on the aircraft as this would no doubt have added to the pressure and congestion at the hospital and other places.
- REV. RENTZ – Noted that ham is a communications support and in this occasion there was particularly speedy response from members – equipment worked well – link arranged between Winni-

peg and Toronto but nobody here to connect – he noted a problem with identification on the radios and this is to be discussed in conjunction with the Town emergency plan – he noted the room used for an ECC was not designed for communications, and an outside antenna with Coax cable is required so they can plug in at both the hospital and the Town office – he noted their batteries are worn down and they are changing their equipment to handle this better in the future – he agreed frequencies are over used by the users – recommends we have a single common frequency.

- ERNIE PARRY – Questioned who called in the helicopters and was the hospital aware and acknowledged the use of helicopters was not viable due to the low ceiling – questioned whether there was a transportation officer in the emergency control group – recommended there be a plan for working with helicopters.
- CHIEF MALTAIS – Responded that Ministry of Natural Resources radios on the base are available for communication with helicopters.
- JOHN CALLAN – Confirmed that these matters would be looked into.
- DOROTHY SMITH – Noted the overlap with the Red Cross on registration, and our forces were then spent primarily on obtaining clothing – noted the need for information packages for the victims – noted the importance of having identification, armbands or something, for the workers.
- VIC KAMEDA – Noted the potential for security problems at the arena used as a temporary morgue, however actual problems were minimal.
- CARL BLEICH – Noted the Red Cross was prepared to look after clothing but the Town had handled this – noted their workers already have emergency identification – acknowledged the problem

with overlap in the Town plan – noted that at the airport, CFR Chief Ernie Parry calls the Red Cross while in town there is some confusion as to their role, which requires clarification – problem with information from Air Ontario in that it was known that there was a large number of survivors and many inquiries, and it was very difficult to deal with people inquiring as to passengers whose names are not on the list of survivors, this may be one area where guidance would be helpful in dealing with this type of inquiry – noted the need to quickly obtain an accurate, up-to-date passenger manifest – noted that the Red Cross has telephone access to the Red Cross in Winnipeg, Thunder Bay and Toronto and numerous inquiries are directed to those locations.

KEN BITTLE

- Noted the passenger manifest request is not as straight forward as it might appear, due to reservations which may be used by someone other than the person who made the reservation, also there are some walk-on passengers – noted the security process to identify bodies – noted that survivors names are not released to the public in order to protect the privacy of themselves and their families.

ALLAN SLOTA

- Confirmed the need for a good registration system and inquiry file for response – noted that workers need to know in advance what types of information can be given and to whom and where to direct other inquiries.

GERRY FERGUSON

- Confirmed problems with the media – noted there were no problems with respect to rescheduling of activities due to the emergency requirement for the use of the second arena – he noted the pool staff are available as fully trained personnel in first aid and CPR.

TED BROADHURST

- Noted the need for Canadian Pacific Forest Products to ensure that their emergency group

is adequately staffed, also to review their equipment list.

- LEN SUOMU – Confirmed that equipment is available in an emergency although it is usually quite remote from town.
- DAROLD ANNESS – Commented on the lighting plant, noting the need for more details on the type of equipment required on the first request – noted one individual had gone to the scene with a power saw but did not receive good directions on where to go – questioned whether there is a need for a forester or an MNR type person familiar with maps, bush roads, etc. – suggested there should be clarification in where to call at anytime of the day or night for help.
- TED BROADHURST – Noted that Canadian Pacific Forest Products has a good supply of long distance telephone lines available for use in the event of a real emergency.
- TREVOR WOODS – Commented on the helicopters – noted that blankets and sleeping bags had been made available – noted the trailer unit and the kitchen tent had been made available, complete with workers and heaters – noted that Bell Canada and Ontario Hydro also offered to assist – noted there are snowshoes, communications base, etc. on the station – suggested there might be a need to review the contact person to be used, and the facilities which are to be made available.
- HUGH SYRJA – Suggested there is a need for more news lines and hold buttons on the telephones – also suggested a private line for the PR person – noted the confusion between the number of people on the flight, it was either 57 and 4 or 65 and 4.
- ROGER NORDLUND – Only problem was that there was only one message from dispatchers.

- DES RISTO – Commented on the various emergency exercises conducted at the Dryden Airport and how they gradually improved, and he noted how the practice had paid off.
- ANDREW SKENE – Final comment, Community Counselling Service is being offered during the evening this week and will continue if required or the hospital will arrange to bring in an emergency trauma team from Toronto.
- REV. RENTZ – Noted the need to look at our procedure for finding places for people to stay.
- INSP. HARVEY – Noted that the identification officers have identified, at this point in time, 17 of the 22 dead.
- CHIEF MALTAIS – Commented on the benefits of the Arnprior training received by many of the Town employees.
- JOHN CALLAN – Noted the need to continue the fine tuning process, invited questions from all present, welcomed representatives from Emergency Planning Ontario and Emergency Planning Canada – noted the differences between the exercises and the real thing.
- PETER LOUTTIT – Commented that the exercise builds up the frame work for the real event.
- BILL DELUCE – Extended compliments on the rescue service provided by the Town and the emergency workers – noted his willingness to co-operate in any way with further development of our emergency plan.
- JIM ELLARD – Noted that the Dryden experience will no doubt be beneficial to many other municipalities.
- MAJOR CHRISTIE – Noted that Canadian Forces plans may be different than civilian plans but offered to

discuss how their services can be accessed – noted one problem with this event in that Trenton was contacted by both the OPP and the Ontario Air Ambulance with conflicting information as to whether it was wanted or not wanted – it is recommended there be only one method of contact.

- H.H. SAMPSON – Extended compliments of Emergency Preparedness College on a good job well done.

- KEN BITTLE – Expressed his thanks to all who are involved.

- MAJOR ARMOUR – Noted there is a need for the Canadian Aviation Safety Board to interview more witnesses
 – noted the municipality operates the airport and is involved and will be requested to comment on the report of the CASB before it is finalized.

Mayor Jones, in his closing remarks, indicated the need to update our Emergency Plan and continue holding exercises on a regular basis. He commented on the need for discipline in the exercising of any plan, the need to keep the delegation line in place, and the need to maintain communications with citizens.

All present were invited to remain after the meeting for sandwiches and coffee.

Meeting adjourned at 4:35 p.m.

DISTRIBUTION: Mayor, Council, John Callan, Bruce Hoffstrom, Paul Heayn, Mel Fisher, Archie McNeil, Sgt. Varga, Det. Sgt. Bolduc, Ed White, John Albanese, Mario Facca (Box 1326, Sioux Lookout) and Maureen Griffiths.

Appendix J



U.S. Department
of Transportation
Federal Aviation
Administration

Appendix II

Advisory Circular

Subject:

COCKPIT RESOURCE MANAGEMENT
TRAINING

Date: 12/1/89

Initiated by: AFS-210

AC No: 120-51

Change:

1. PURPOSE. This advisory circular (AC) presents guidelines for developing, implementing, and evaluating a cockpit resource management (CRM) training program. This training is designed to be a regular part of all training for crewmembers.

2. RELATED FAR SECTIONS.

- a. SFAR 58, Advanced Qualification Program.
- b. Part 121, Subpart N (Training). 121.400-405, 121.409-421, 121.424, 121.427.
- c. Part 121, Subpart O (Crewmember Qualifications). 121.432-433, 121.434, 121.440-443.
- d. Part 135, Subpart E (Flight Crewmember Requirements). 135.243-245.
- e. Part 135, Subpart G (Crewmember Testing Requirements). 135.293-295, 135.299-301.
- f. Part 135, Subpart H (Training). 135.321-331, 135.335-351.

3. RELATED READING MATERIAL. For detailed information on the recommendations made in this AC, the reader is encouraged to review Cockpit Resource Management Training: Proceedings of a NASA/MAC Workshop, 1987. The National Aeronautics and Space Administration (NASA) Conference Proceedings (CP) number is 2455. Copies may be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161, (703) 487-4650.

4. BACKGROUND.

a. Investigations into the causes of air carrier accidents have shown that human error is a contributing factor in approximately 70 percent of all air carrier incidents and accidents. Most airlines, however, provide technical training with little emphasis on the human element. This AC provides guidelines for FAR Parts 121 and 135 certificate holders to establish training that is designed to increase the efficiency with which flight crewmembers interact in the cockpit by focusing on communication skills, teamwork, task allocation, and decisionmaking.

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b. Since 1979, an increasing amount of evidence has accumulated suggesting that between 60 and 80 percent of air carrier incidents and accidents have been caused, at least in part, by a failure of the flightcrew to make use of readily available resources. A long-term NASA research program has demonstrated that these types of incidents have many common characteristics. One of the most compelling observations of this program and other research studies is that, often, the problems encountered by flightcrews have very little to do with the more technical aspects of operating a multicrewmember aircraft. Instead, they are associated with poor group decisionmaking, ineffective communication, inadequate leadership, and poor management. In addition, most training programs emphasize almost exclusively the technical aspects of flying and do not deal effectively with various types of crew management strategies and techniques that are also essential to safe flight operations.

c. These observations have recently led to a developing consensus in both industry and government that more training emphasis needs to be placed upon the factors that influence crew coordination and the management of crew resources. Briefly defined, CRM is the effective utilization of all available resources--hardware, software, and people--to achieve safe and efficient flight operations. CRM training programs have been or are being developed by several major air carriers, and although the concept is receiving widespread acceptance, insufficient progress has been made in the industry as a whole. Moreover, there is substantial confusion in the industry with respect to the key elements of CRM training and how to go about developing a CRM training program.

d. A 1987 NASA workshop on CRM training, comprised of various segments of the aviation community, has produced a series of recommendations for training programs in this area. These guidelines, while not mandatory, are very useful in understanding the critical elements of a CRM training program.

5. BASIC CONCEPTS OF CRM TRAINING.

a. General. While there are probably many approaches and techniques useful in CRM training, it seems clear that certain features are necessary. The program should focus on the functioning of crews as intact teams, not simply as a collection of technically competent individuals, and should provide opportunities for crewmembers to practice the skills that are necessary to be good team leaders and members. This requires training exercises that include all crewmembers together in the same roles they normally perform in flight. The program should help crewmembers learn how to use their own personal and leadership styles in ways that foster crew effectiveness. The program should also help crewmembers learn that how they behave during normal, routine circumstances can have a powerful impact on how well a crew functions during high workload, stressful situations. During these emergency situations, it is highly unlikely (and probably undesirable) that any crewmember will take the time to reflect upon his or her CRM training to figure out how to act. However, actions taken during more relaxed times probably increase the chances that a crew will handle stressful situations more competently.

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b. Research studies from the behavioral sciences strongly suggest that behavior change in any environment cannot be accomplished in a short period, even if the training is very well designed. Trainees need time, awareness, practice and feedback, and continual reinforcement to learn lessons that will endure over long periods of time. In order to be effective, CRM training must be accomplished in several phases over time.

c. Therefore, CRM training programs should include at least three distinct phases:

(1) An awareness phase where CRM issues are defined and discussed.

(2) A practice and feedback phase where trainees gain experience with CRM techniques.

(3) A continual reinforcement phase where CRM principles are addressed on a long-term basis. Each of these phases is discussed in more detail in paragraph 7 and in NASA CP number 2455.

d. Summary. CRM is defined by the following basic concepts:

(1) It is a comprehensive system for improving crew performance.

(2) It is designed for the entire crew population.

(3) It can be extended to all forms of aircrew training.

(4) It concentrates on crewmember attitudes and behaviors and their impact on safety.

(5) It provides an opportunity for individuals to examine their own behavior and make individual decisions on how to improve cockpit teamwork.

(6) It uses the crew as the unit of training.

(7) It is a training program that requires the active participation of all cockpit crewmembers.

6. PHASES OF CRM TRAINING.

a. Overall Objective of CRM. CRM training is designed to prevent incidents and accidents.

b. Awareness Phase.

(1) The awareness phase of CRM training consists of classroom presentations and focuses on interpersonal relations and crew coordination. This part of the training also provides a common terminology and conceptual framework for identifying and describing crew coordination problems.

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(2) This training phase can be accomplished by a combination of training methods such as lecture presentations, discussion groups, role-playing exercises, computer-based instruction, and videotape examples of good and poor team behavior in the cockpit.

(3) A useful way of beginning the awareness phase may include the development of a curriculum addressing CRM skills that should be acquired, such as:

(i) Communication. (E.g., cultural influences, barriers such as rank, age, and position, assertiveness, participation of all crewmembers, cockpit-cabin crew coordination, listening, feedback, and legitimate ways of expressing dissent.)

(ii) Situation Awareness. (E.g., reality versus perceptions of— reality, fixation, monitoring, incapacitation.)

(iii) Problem Solving/Decisionmaking/Judgment. (E.g., conflict resolution, review.)

(iv) Team Management. (E.g., team building, managerial skills, authority, barriers, cultural influences, roles, workload management.)

(v) Stress Management. (E.g., fitness to fly, fatigue, incapacitation.)

(vi) Team Review. (E.g., premission analysis and planning, critique, ongoing review, postmission.)

(vii) Interpersonal Skills. (E.g., listening, conflict resolution, and legitimate avenues of dissent.)

(4) Awareness promotes credibility and helps in changing attitudes, however, it is important to recognize that it is only a necessary first step. Many programs rely almost exclusively on this aspect of training, but classroom instruction alone may not fundamentally alter crewmember attitudes and behavior over the long term.

c. Practice and Feedback Phase.

(1) The practice and feedback phase of CRM training is designed to provide participants with self- and peer-critique in order to improve communication, decisionmaking, and leadership skills. This phase is best accomplished through the use of simulators and video equipment. Video feedback, under the direction of a facilitator, is particularly effective because it allows participants to view themselves from a third-person perspective; this promotes acceptance of one's weak areas, which encourages attitude and behavior changes.

(2) Practice and video feedback during debriefing can be accomplished as follows:

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(i) Line oriented flight training (LOFT) sessions or other simulated or actual operation scenarios can include CRM training. In these cases, crewmembers would be in a simulator and asked to respond to a series of incidents which could or could not lead to emergencies. They would be evaluated for technical expertise, as well as communication, coping, and coordination abilities (as part of the CRM training).

(ii) Video feedback during debriefing should optimally be provided so that crewmembers could evaluate their skills.

(iii) In cases where simulators are not available, crewmembers can participate in complicated group problem-solving exercises. Through video feedback during debriefing, they can then evaluate the positive and negative actions of all crewmembers.

(iv) Crewmembers can also participate in role-playing exercises designed to provide practice in developing strategies for dealing with incidents and to allow analyses of behaviors during incidents. Again, video feedback is recommended for evaluation and feedback during debriefing of crewmember abilities in such areas as decisionmaking, team participation, and team leadership sharing.

(v) Personality and attitude measures can also be used to provide feedback to participants, thereby allowing them to assess their strengths and weaknesses.

d. Reinforcement Phase.

(1) The third phase is reinforcement. No matter how effective the classroom curriculum, interpersonal drills, LOFT exercises, and feedback techniques are, a single exposure will be insufficient. The attitudes and norms which contribute to ineffective crew coordination are ubiquitous and have developed over a crewmember's lifetime. Thus, it is unrealistic to expect a short training program to make up for a lifetime of development. To be maximally effective, CRM should be embedded in the total training program. It should be continually reinforced, and it should become an inseparable part of the organization's culture. The latter is often overlooked, but it is clear that effective CRM training requires the support of the highest levels of management.

(2) CRM training should be instituted as a regular part of the recurrent training requirement. Recurrent CRM training should include refresher curriculum and practice and feedback exercises such as LOFT with video feedback, or a suitable substitute employing video feedback. It is particularly important that some of these recurrent CRM exercises take place with a full crew--each member operating in their normal crew position. For example, recurrent training LOFT exercises designed for CRM should be conducted only with an actual crew.

(3) There is a natural tendency to think of CRM as training only for the "managers" or captains. However, this notion misses the essence of the

primary CRM training objective--the prevention of crew-related incidents and accidents. It should be most effective in the entire crew context, and this requires training exercises that include all crewmembers working together and learning together. In the past, much of flightcrew training has been separated by crew position, and while this may be effective for certain types of training (e.g., technical skills and systems knowledge, etc.), it is not appropriate for CRM training.

7. THE ROLE OF CRM INSTRUCTORS AND CHECK AIRMEN.

a. General.

(1) The success of any CRM training program should ultimately depend upon the skills of the personnel responsible for administering the training and observing its effects. Thus, it is vitally important that CRM training instructors, facilitators, and check pilots be highly skilled in all areas related to CRM performance, and they should also be expert observers of crew coordination dimensions. These skills are different from those associated with traditional flight instruction. Gaining proficiency in CRM instruction and observation will require special additional training for instructors and check pilots in CRM training methods such as role-playing exercises, systematic crew observation, providing effective feedback, and LOFT administration.

(2) In addition, simulator and line check pilots should utilize every available opportunity to emphasize the importance of crew coordination skills and techniques. This should be accomplished by not only pointing out deficiencies, but by noting and reinforcing instances of highly effective crew coordination whenever such behavior is observed.

8. EVALUATION OF CRM TRAINING PROGRAMS.

a. General.

(1) CRM training is a relatively new concept still in the process of evolution. For this reason, it is vitally important that each program be evaluated in order to determine whether it is achieving the desired result, the improvement of flightcrew coordination and performance. Thus, each organization should organize a systematic evaluation program to track the effect of their training program and as a means of making continuous improvements. The emphasis of this evaluation process should be on crew performance, not at the individual level of analysis. The major areas that should be assessed are: interpersonal coordination and communication; problem-solving and conflict resolution; workload management; and technical performance.

(2) The purpose of this evaluation is not to assess individual crewmembers on CRM-related dimensions as a means of assessing their fitness for duty. The current state-of-the-art in the measurement of CRM-related behavior does not allow such fine discriminations at the present time. However, the importance of these dimensions should be emphasized to individual

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crewmembers at all available opportunities, and improvements in assessment techniques may allow CRM-related criteria to be utilized on a more formal basis in the future.

9. COLLECTION OF EVALUATION DATA. In an optimal research design, data on crewmember's CRM attitudes and behavior should be collected prior to the awareness phase of CRM training and again at intervals after training to determine both initial and enduring effects of the program. In many cases, however, this pure evaluation strategy cannot be applied, as many crewmembers may have already completed some type of CRM training. The goal should be to obtain an accurate picture of the state of the organization before formal adoption of this type of training and to continue to monitor the same elements after adoption.

10. EVALUATION TOOLS.

a. Data collection could include a survey of crewmember's attitudes regarding CRM concepts and also their evaluation of the impact of formal CRM training, LOFT, or of an operational scenario. (An example of a crewmember survey is provided in Appendix 1.)

b. Additional data could be collected by check airmen, qualified line observers, and/or LOFT instructors trained in the formal evaluation of crew coordination. An evaluation worksheet could be completed after LOFT periods or other operational simulations. The evaluation worksheet should contain evaluations of the crew's utilization of the key concepts of CRM described in paragraph 6, as well as a global evaluation of overall technical performance and crew coordination. Additional information for each crew should include a description of special circumstances (i.e., abnormal or emergency situations imposed or encountered) and amplifying comments regarding extremely good or poor instances of CRM behavior. (An example LOFT CRM Evaluation Worksheet is provided in Appendix 2.)

11. DATA BASES. Information collected from line crewmembers, check airmen, qualified line observers, and other evaluators should be maintained in computer-resident data bases. The data should be oriented toward group rather than individual performance. Data should not identify individual crewmembers by name, but should include the following demographic identification:

- a. Aircraft type.
- b. Crew position.
- c. Approximate age (range).
- d. Approximate experience in position and aircraft.
- e. Formal training in CRM.
- f. Experience with LOFT of operational scenarios.

AC 120-51

12/1/89

(1) On both crewmember surveys and evaluations, the instructor or check airman should be identified. Information from participants in training and the characteristics of evaluations given by check airmen and other evaluators may be used as measures of the quality of instruction and evaluation.

(2) It should be stressed that the reasons for collecting evaluation data include:

- (i) To measure the operational state of the organization.
- (ii) To determine areas in need of further instruction.
- (iii) To find which aspects of training work most effectively.
- (iv) To ensure that all individuals involved in training and evaluation are well prepared and standardized.



Daniel C. Beaudette
Director, Flight Standards Service

Appendix K

Ministre des Transports



Minister of Transport

June 6, 1991

The Honourable Mr. Justice Virgil P. Moshansky
Commissioner
Commission of Inquiry into
The Air Ontario Crash at Dryden, Ontario
P.O. Box 687 Adelaide Station
Toronto, Ontario
M5C 2J8

Dear Mr. Justice Moshansky:

RE: AVIATION SAFETY RECOMMENDATIONS
DRYDEN COMMISSION OF INQUIRY, SECOND INTERIM REPORT

I am writing in reply to the recommendations contained in Part 5 of the Commission's Second Interim Report which was tabled in the House of Commons on December 11, 1990.

These interim recommendations were made in the interests of aviation safety as a result of the Commission's ongoing investigation into the circumstances surrounding the accident involving an Air Ontario F-28 aircraft, at Dryden Ontario, on March 10, 1989.

My staff and I have reviewed these recommendations and I am pleased to provide you with the attached written response which formalizes the department's initial response given at the time of the report release.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jean Corbeil".

Jean Corbeil

Attachments

TRANSPORT CANADA RESPONSE
TO THE
INTERIM RECOMMENDATIONS
OF THE SECOND INTERIM REPORT
DRYDEN COMMISSION OF INQUIRY

INTERIM RECOMMENDATION NO. 1 - RUNWAY-END DE-ICING/ANTI-ICING:

"Transport Canada should, on a priority basis and in co-operation with major air carriers, implement interim runway-end de-icing/anti-icing facilities at Pearson International Airport. The target should be to have the first of such facilities in place on an interim basis as early as possible in the 1990-91 icing season. Subsequent permanent installations should be designed and constructed to satisfy both safety and environmental concerns."

TRANSPORT CANADA RESPONSE:

Transport Canada accepts the need for dedicated facilities for de-icing. Construction of dedicated de-icing facilities for the 1990/91 winter season was not possible as it was too late to initiate and complete a construction project of this magnitude. In addition, agreement by all carriers on standard de-icing procedures and additional de-icing equipment is required. In the long term, there is general agreement between Transport Canada and the air carriers that dedicated de-icing facilities are required at Lester B. Pearson International Airport (LBPIA). NORR Airport Planning Associates completed a feasibility study in February 1991. The study recommended two of the three proposed airfield sites as being suitable. A recommended development plan was forwarded to the LBPIA Airline Consultative Committee (ACC) for review. A recommendation will be made by the project manager by the end of May 1991. The study addresses LBPIA but could provide national guidance.

INTERIM RECOMMENDATION NO. 2 - GATE-HOLD PROCEDURES:

"Transport Canada should examine and, if feasible, implement air traffic control gate-hold procedures at Pearson International Airport as a means of reducing departure delays during conditions of freezing precipitation."

TRANSPORT CANADA RESPONSE:

Transport Canada, in cooperation with the aviation industry, has implemented gate-hold procedures at LBPIA during periods of freezing precipitation. In addition, an Air Carrier Advisory Circular was sent on January 3, 1991 informing air carriers of the procedures being implemented at LBPIA to eliminate aircraft congestion at the runways during inclement weather.

- 2 -

INTERIM RECOMMENDATION NO. 3 - RAMP AREA EXPANSION:

"In addition to the already announced feasibility studies for two new runways and supporting taxiways at Pearson International Airport, Transport Canada should investigate and, if feasible, proceed to implement an expansion of existing ramp space on the airport to reduce congestion and consequent departure delays. This undertaking should be given high priority."

TRANSPORT CANADA RESPONSE:

A study was undertaken to examine this matter. The consulting firm, Aviation Planning Services of Montreal has completed the analytical work and are discussing the details with airport staff.

INTERIM RECOMMENDATION NO. 4 - USE OF TYPE II ANTI-ICING FLUIDS:

"Transport Canada should strongly encourage and support the use by Canadian air carriers of type II anti-icing fluids that meet AEA specifications for turbo jet aircraft and, where applicable, for propeller-driven aircraft."

TRANSPORT CANADA RESPONSE:

The Minister of Transport has written to all Canadian air carriers strongly encouraging and supporting the use of type II fluids.

INTERIM RECOMMENDATION NO. 5 - RAMP AREA LIGHTING:

"Transport Canada should, in the interest of employee safety and in order to facilitate reliable inspection of aircraft surfaces after de-icing/anti-icing, ensure that adequate and sufficient exterior lighting exists in all gate and ramp areas where de-icing and anti-icing operations are conducted at Pearson International Airport and at other major airports in Canada."

TRANSPORT CANADA RESPONSE:

The lighting levels on the apron areas where de-icing operations are conducted have been evaluated on a number of occasions and found to be consistent with Transport Canada and International Civil Aviation Organization (ICAO) apron floodlighting standards. Notwithstanding the above, steps have been taken to improve lighting levels. Construction will begin in April, 1991 on a program to improve apron lighting at terminal 1, with completion scheduled for fall 1991. Two sets of high pressure sodium lights have been installed at terminal 2 for test and evaluation purposes.

- 3 -

INTERIM RECOMMENDATION NO. 6 - CLEAN AIRCRAFT COMPLIANCE:

"Transport Canada should, on a priority basis, provide, where necessary, enforcement resources to ensure that the clean aircraft regulation is complied with, including runway-end spot checks of aircraft surfaces in adverse winter weather."

TRANSPORT CANADA RESPONSE:

Transport Canada regulatory officials were tasked to monitor and enforce the regulations during inclement weather this winter at LBPTA and other Canadian airports. Monitoring guidelines were issued to assist inspectors in enforcing the regulations. These guidelines include the requirement for spot checks at appropriate locations on airports.

INTERIM RECOMMENDATION NO. 7 - PROVISION OF DE-ICING/ANTI-ICING SERVICE:

"Transport Canada should strongly encourage Canadian air carriers to form joint entities to provide all air carrier de-icing/anti-icing services at Pearson International Airport and at other major airports in Canada, and to have available, for use when necessary, equipment capable of applying both type I and type II fluids."

TRANSPORT CANADA RESPONSE:

The Minister of Transport has written to all Canadian air carriers strongly encouraging and supporting this recommendation.

INTERIM RECOMMENDATION NO. 8 - DE-ICING/ANTI-ICING PROCEDURES TRAINING:

"Transport Canada should require that air carriers produce aircraft ground de-icing/anti-icing procedures and training standards for both flight and ground Personnel. Implementation of such procedures and standards should be made a mandatory requirement of an air carrier's operating certificate."

TRANSPORT CANADA RESPONSE:

Transport Canada developed and distributed a training program to all carriers in November, 1990 which included procedures and standards for aircraft ground de-icing and anti-icing. This program has been distributed for immediate implementation as required by regulation. All training, including the new de-icing/anti-icing material, is required to be included in the carrier's Operation Manual, which is a condition of issue of the operating certificate.

- 4 -

INTERIM RECOMMENDATION NO. 9 - TC INSPECTOR/MAJOR CANADIAN AIRPORTS:

"Transport Canada's Airports Authority Group should place on the staff of each of its major airports, individuals with substantial flight operations expertise. Such individuals should report directly to the airport manager on any issue related to operational safety. Furthermore, a mandatory reporting process should be put in place to ensure that aviation safety-related issues are promptly brought to the attention of the appropriate decision-making level of senior management and to ensure that such issues are addressed within a specified period of time."

TRANSPORT CANADA RESPONSE:

Transport Canada has staffed such a position at Lester B. Pearson and Vancouver airports. The Department will study the applicability to other major airports in Canada and will determine the reporting relationships to ensure that safety-related issues are promptly brought to the attention of the appropriate level of senior management.

INTERIM RECOMMENDATION NO. 10 - HOLD-OVER TIMES/DEPARTURE DELAYS:

"Transport Canada should examine, on a priority basis, Canadian airports served by air carriers to ascertain if the incompatibility between departure delays and de-icing/anti-icing fluid hold-over times, as identified at Toronto's Pearson International Airport, exists at other sites. Should such incompatibilities be found, Transport Canada should ensure that appropriate corrective measures are taken."

TRANSPORT CANADA RESPONSE:

Through Transport Canada's monitoring of airports during inclement weather conditions, congestion problems, if existing elsewhere than LBPIA, will be noted and appropriate corrective measures will be taken. Instructions have also gone out to all Transport Canada Airport Managers to work with the air carriers to expedite operations during poor weather conditions and to report on any problems where safety is a concern.

INTERIM RECOMMENDATION NO. 11 - CLEAN-UP OF DE-ICING/ANTI-ICING FLUID:

"Transport Canada and/or the air carriers should, in the interests of ramp employee safety and for environmental reasons, maintain suitable equipment and develop appropriate procedures for the clean-up and disposal of de-icing/anti-icing fluids in areas utilized by air carriers."

TRANSPORT CANADA RESPONSE:

Glycol pickup equipment was acquired for LBPIA on a priority basis. This equipment reduced the glycol environmental problem to the maximum extent possible for the 1990/91 winter season. In the long term, the dedicated de-icing facilities will also include a glycol recovery system. It should be noted that the new Terminal 3 at LBPIA has an underground glycol collection facility.

INTERIM RECOMMENDATION NO. 12 - CANADA - DE-ICING/ANTI-ICING TECHNOLOGY:

"Transport Canada should take an active and participatory role in the work currently underway within the international aviation community to advance aircraft ground de-icing/anti-icing technology. This should include involvement in the development of international standards, development of guidance material for remote and runway-end de-icing facilities, and development of more reliable methods of predicting de-icing/anti-icing fluid hold-over times."

TRANSPORT CANADA RESPONSE:

The Transport Canada Transportation Development Centre has, for a number of years, in collaboration with other government agencies including the Department of National Defence and the National Research Council, the U.S. Federal Aviation Administration and the European as well as North American aviation industry, been actively researching and developing state of the art aircraft anti-icing and de-icing technologies. Current research centres on the use of anti-icing fluids along with associated hold-over times and the development of aircraft sensors to detect ice on wings and other critical surfaces. Transport Canada, recognizing the importance of this issue internationally, has asked that a working group be established in ICAO, with Transport Canada participation, with the objective of pooling research information on de-icing/anti-icing fluids and techniques, and establishing an international standard of operating procedures.

INTERIM RECOMMENDATION NO. 13 - FLUID HOLD-OVER TIME CHARTS:

"Transport Canada should strongly encourage Canadian air carriers to provide their flight crews with de-icing/anti-icing fluid hold-over time charts that are based on the most recent technological information. These charts should be used as guidelines."

TRANSPORT CANADA RESPONSE:

The Minister of Transport has written to all Canadian air carriers encouraging them to use hold-over time charts as a guidance to flight crews.

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AMENDMENT #8 -- May 3, 1991

includes comments by:

AAX
AAR
AKPT

Appendix L

Commission of Inquiry
into the Air Ontario Crash
at Dryden, Ontario



Commission d'enquête
sur l'écrasement d'un avion
d'Air Ontario à Dryden (Ontario)

Commissioner
The Honourable Virgil P. Moshansky
Counsel
F.R. von Veh, q.c.
Associate Counsel
G.L. Wells
Administrator
R.J. McBey

Commissaire
L'honorable Virgil P. Moshansky
Conseiller juridique
F.R. von Veh, c.r.
Conseiller juridique associé
G.L. Wells
Administrateur
R.J. McBey

CONFIDENTIAL

★

★

Dear *****:

RE: INQUIRIES ACT, SECTION 13
Affected Party - *****

The Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario was established by Order in Council P.C. 1989-532, dated March 29, 1989, to inquire into, and report on the contributing factors and causes of the crash of Air Ontario Flight 1363 at Dryden, Ontario, on March 10, 1989. Commissioner Moshansky was also asked to make such recommendations as he deemed appropriate in the interests of aviation safety.

Throughout the course of the Commission hearings, all Participants were afforded the opportunity to cross-examine all witnesses, either through their counsel or representative, to submit written briefs to the Commission and, if they so desired, to recommend to the Commissioner that additional witnesses, other than the ones called by the Commission, be called to testify. As well, all Participants, either through their counsel or representative, were given a synopsis of witnesses evidence and copies of all relevant documentation before any given witness was called to testify. Such documents were subsequently filed before the Commission as exhibits. In addition, at the conclusion of the public hearings of this Commission, all Participants were given full opportunity to present submissions to the Commissioner as they saw fit.

- 2 -

Section 13 of the Inquiries Act states that:

No report shall be made against any person until reasonable notice has been given to the person of the charge of misconduct alleged against him and the person has been allowed full opportunity to be heard in person or by counsel.

This letter shall constitute notice that the Commissioner will hear and consider any submissions that you or your counsel may wish to make in relation to adverse findings made against you. Although the Inquiries Act addresses a "charge of misconduct", in the interest of fairness, Commissioner Moshansky has directed that notice be afforded to all persons against whom he may make adverse findings. The Commissioner has advised me that he does not view the findings enumerated below as constituting "misconduct" within the meaning of Section 13 of the Inquiries Act.

INSERT ADVERSE FINDINGS

Please consider this letter as official notice pursuant to the provisions of section 13 of the Inquiries Act, and advise the Commission in writing on or before Friday, September 20, 1991, if you wish:

1. to be heard in person or by counsel;
2. to be heard by means of written submissions; or
3. not to be heard by the Commission.

SHOULD YOU NOT RESPOND ON OR BEFORE FRIDAY SEPTEMBER 20, 1991, IT WILL BE TAKEN TO MEAN THAT YOU HAVE WAIVED YOUR RIGHT TO BE HEARD PURSUANT TO THE INQUIRIES ACT, SECTION 13.

It is to be noted that any submissions presented pursuant to this procedure will be carefully considered by the Commissioner in preparation of his Final Report. Written submissions are to be received by the Commission on or before **FRIDAY, SEPTEMBER 27, 1991.**

If you choose to make submissions in person or by counsel, the Commission will hold individual hearings in camera at 595 Bay Street, 14th floor, Toronto, Ontario. In such event, a hearing date will be scheduled after receipt of your response to this notice and you will thereafter be notified in writing of the date set for the hearing.

- 3 -

In order to prevent disclosure of the potential findings of this Commission prior to release of the Final Report, the Commissioner requires that the contents of this correspondence be kept in absolute and strict confidence.

If you have any questions regarding any of the foregoing, please do not hesitate to contact me.

Yours truly,

F.R. von Veh, Q.C.
Commission Counsel

FVV/sct

Appendix M

Rulings

1 Rulings Regarding Status Applications on behalf of Victims, Survivors and their Families (May 26, 1989)

THE COMMISSIONER: I at this time wish to extend a welcome to everyone who is present here this morning. We are here to deal with the issue of status, which is most important to the orderly conduct of a commission of inquiry. By the Order in Council, which has been filed as an exhibit and which is dated March 29th, 1989, this Commission was directed to inquire, pursuant to the provisions of part I of the *Inquiries Act*, into the contributing factors and causes of the crash of the Air Ontario F-28 aircraft at Dryden, Ontario, on March 10th, 1989, and to report thereon, including such recommendations as may be deemed appropriate in the interests of aviation safety.

In order to assist the Commission in these investigatory and advisory functions, the participation of interested parties is most welcome. However, in order to facilitate the effective, efficient, timely, and fair conduct of the Inquiry, party participation must necessarily be limited.

Legal and practical considerations dictate the necessity of establishing boundaries to participant status which will permit the fair, orderly, timely, and effective conduct of the Inquiry.

It is my intention that the concept of procedural fairness shall be a basic tenet of this Inquiry. To that end I have previously directed that certain interested parties shall be entitled to full status as participants on the various investigative teams involved in the investigation of this matter. This marks the first time that interested parties have been granted such status in the process of aircraft accident investigation in Canada. Up to the present time, interested parties have only been accorded observer status on investigative teams. It is the view of all concerned that interested parties have much to contribute to the investigative process by seconding to the investigative teams persons with specialized expertise in various areas under investigation.

Having regard to the statutory authority vested in me as Commissioner and having regard to the terms of reference and to the developments in the law relating to commissions of inquiry, I have concluded that it is appropriate to permit three categories of party participation, and these will be: full participant, special participant, and observer. All participants will have access to working spaces at designated counsel tables in the Commission's hearing rooms.

I will first deal with the category of full participant.

Parties who are granted the status of a full participant will be permitted representation by counsel. Their counsel will be able to cross-examine Commission witnesses, submit written briefs to the Commission, and, if necessary, to recommend to the Commissioner the calling of certain witnesses. In the course of any commission of inquiry, allegations will be made at public hearings which will reflect adversely on certain parties. It is my position that any party adversely implicated by testimony at the public hearings of the Commission shall be given a full opportunity to be heard.

I will now deal with the category of special participant status.

This category of status could apply to the participation of crash survivors and the estates of crash victims. While one has great sympathy for these parties and, while the testimony of survivors will be no doubt important in discovering the causes of the accident, it is believed that their individual involvement as full participants would not contribute significantly to the present Inquiry into the contributing factors and causes of the crash.

Given the large number of parties similarly situated in this regard, it is believed that their individual participation at public hearings would become unwieldy and ultimately counterproductive. However, recognizing their profound interest in the findings of this Inquiry and having regard to the practical difficulties inherent in their individual participation, I am prepared to hear representation this morning in connection with the granting of special participant status to one counsel representing the collective interests of the crash survivors and the estates of the crash victims. It is my intention that the representative counsel on behalf of the special participant would be entitled to cross-examine Commission witnesses and to submit written briefs to the Commission.

The final category of participants who may be involved in the Inquiry is that of observers. Individual representatives of survivors and of estates, if they so request, and any other party establishing a special interest in these proceedings, will be granted status as an observer at the Commission.

An observer will be entitled to submit written briefs to the Commission. Additionally, observers will be permitted to submit written suggestions to Commission counsel regarding the calling of evidence. Without limiting the generality of the foregoing these written suggestions may include prospective questions that the observer believes should be asked of a particular witness by Commission counsel or may include suggestions as to prospective witnesses that the observer believes should be called before the Commission. The form and substance of the response to these suggestions will, however, be at the complete discretion of Commission counsel.

A letter outlining rules of procedure will be mailed to all participants shortly. Additional specific rules of procedure may also be outlined at the initial formal hearing of the Commission which is scheduled to commence in Toronto on June 16th, 1989.

We will now proceed to hear the applicants for status.

(Transcript, vol. 1, pp. 7-12)

THE COMMISSIONER: On the basis of the representations that I have heard, I deem it appropriate in these circumstances to grant to the applicants special participant status to one counsel to represent the collective interests of the group in question with the proviso that such counsel position may be filled by two or more counsel as are agreed upon by the parties.

(Transcript, vol. 1, pp. 19-20)

2 Ruling Regarding Applications for Legal Costs – Survivors and Victims' Families – CUPE Airline Division (September 11, 1989)

THE COMMISSIONER: At the status hearings of this Commission held in Toronto, Ontario, on the 26th day of May, 1989, there appeared before me Mr Alexander Zaitzeff and Mr W. Danial Newton in their respective capacity as counsel on behalf of several victims, estates, and/or survivors of the crash of Air Ontario Flight 1363 at Dryden, Ontario, on March 10th, 1989.

Mr Zaitzeff and Mr Newton appeared also as representatives of a group of legal counsel acting on behalf of a majority of the remaining crash survivors and victims' estates with the concurrence of all such counsel. They made an application on behalf of all of those parties whom they represented and to whom I shall hereinafter refer as "the Applicant group" for status before this Commission with full rights of cross-examination.

Having regard to all of the circumstances and the arguments advanced by counsel, I deemed it appropriate to exercise my discretion by granting special participant status to a single representative of the collective interests of the survivors and the estates of the crash victims, notwithstanding the absence of any precedent for so doing.

The said counsel appearing for this Applicant group then made a further application before me on behalf of the Applicant group seeking financial assistance with respect to their legal costs. Counsel for the Applicant group represented to me that without such assistance the Applicants would be unable to actively participate at the hearings of this Commission. I reserved decision with respect to this application pending the submission by counsel for the Applicant group, at my request, of

written argument in support of their application. Such written argument was subsequently received by me.

In addition, some 25 letters were received by the Commission during the month of July 1989 from various counsel, representing the majority of the survivors and victims involved, in support of the position taken by Mr Zaitzeff and Mr Newton in their request for funding.

A further application for financial assistance with respect to legal costs was also made at that time by Ms Leanne Chahley, counsel for the Canadian Union of Public Employees, Airline Division, which organization's request for full participant status was granted at the said status hearings of this Commission. On July 10th, 1989, Ms Chahley wrote a letter to the Commission in response to my request that she provide a written submission in support of her application for funding. She indicated that the organization of which she represents has a membership of more than 8,400 flight attendants and customer service agents, and that it has a demonstrated history of participation in inquiries relating to the airline industry ... having previously appeared at several hearings in Canada and the United States.

There is nothing in the material submitted to me to suggest that these previous appearances at such hearings were funded out of the public purse.

Although the Canadian Union of Public Employees, Airline Division, does not have a specific allocation of funds for this type of proceeding, as was indicated by Ms Chahley in her letter, I am not at all persuaded by the material before me that an organization of this magnitude would be unable to make other arrangements to fund legal representation before the Commission if it saw fit. Its previous history of participation infers as much. In any event, I am not persuaded that it is in the public interest in this case to recommend funding to institutions or organizations who have sought participant status. This application is, therefore, declined.

The Government of Canada in this matter have seen fit to provide in the terms of reference for this Commission of Inquiry established under part I of the *Inquiries Act* a direction to the Commissioner to advise the Governor in Council as to which, if any, of the groups or individuals that may appear before him should receive assistance with respect to the legal costs that they may incur in respect of their appearance before the Commission. And the extent of such assistance where such assistance would, in the opinion of the Commissioner, be in the public interest.

Paragraph (e) of the minutes of a meeting of the committee of the Privy Council establishing this Commission held on the 29th day of March, 1989, reads as follows:

(e) The Commissioner be directed to advise the Governor in Council as to which, if any, of the groups or individuals that may appear before him should receive assistance with respect to the legal costs they may incur in respect of those appearances, and the extent of such assistance where such assistance would, in the opinion of the Commissioner, be in the public interest.

It will be seen from a reading of paragraph (e) of the minutes referred to that the Commissioner is not empowered to grant legal costs as such but, rather, is authorized to make recommendations for the funding of the legal costs of a participant where, in the opinion of the Commissioner, such assistance would be in the public interest.

At the status hearings of this Inquiry, I expressed my intention that the Inquiry would be conducted in accordance with the principle of procedural fairness, a doctrine which is flexible in concept and whose content varies depending on the nature of the Inquiry and the consequences to the individuals involved. It is my view with respect to the present application, that my discretion in this matter ought to be exercised having regard to the principle of procedural fairness and also the public interest itself.

Counsel for the application group have, in their written argument, referred to certain criteria which were applied to the question of participant funding at the Mackenzie Valley Pipeline Inquiry, from which criteria certain guidelines have been set out in a text entitled *A Handbook on the Conduct of Public Inquiries in Canada* (1985) by R.J. Anthony and A.R. Lucas.

I have found these guidelines to be useful in my consideration of the application made by the Applicant group which guidelines are as follows:

- (a) There should be a clearly ascertainable interest that ought to be represented at the inquiry.
- (b) It should be established that separate and adequate representation of that interest will make a necessary and substantial contribution to the inquiry.
- (c) Those seeking funds should have an established record of concern for, and should have demonstrated their own commitment, to the interest they seek to represent.
- (d) It should be shown that those seeking funds do not have sufficient financial resources to enable them adequately to represent that interest, and will require funds to do so.
- (e) Those seeking funds should have a clear proposal as to the use they intend to make of the funds, and should be sufficiently well organized to account for the funds.

On the basis of the material before me, I am satisfied that the Applicant group has met the criteria set out in paragraphs (a) to (d) inclusive.

With respect to paragraph (e) counsel for the Applicant group have proposed the following uses of the funds which it seeks. The funds that would be made available to the group would be for the compensation of counsel and appropriate and limited support staff for purposes of the hearings.

The counsel would be required to submit detailed accounts for services rendered in the normal fashion to the Commission offices for review. There would also have to be budget monies available for distribution of information, correspondence, copies of evidence, transcripts, and the multitude of disbursements that a matter of this nature necessarily attracts.

While I am not bound in the exercise of my discretion by the decisions of previous commissions of inquiry, it is nevertheless useful to examine funding decisions made in other inquiries, several of which have been referred to in the written submission filed with the Commission by Mr Zaitzeff.

A principle which clearly emerges from previous inquiry decisions is that funding is almost invariably provided to individuals who may be personally vulnerable to adverse testimony before the Commission, and who were unable to finance legal representation.

In the case of the Royal Commission into the Donald Marshall Jr Prosecution, in addition to recommending funding for legal counsel for individuals who were involved in the arrest and prosecution of Donald Marshall, the Commission also recommended funding for the following:

- (a) A parent who was endeavouring to protect the reputation of his son, the murder victim, whose character was under attack by testimony before the Commission.
- (b) Two public interest groups, the Black United Front and the Union of Nova Scotia Indians, both of whom held the view that the discrimination and racism influence the administration of justice in Nova Scotia and may have contributed to Marshall's conviction.

The Commission in its ruling stated the following:

We believe that the public interest requires, in a proper case, that the point of view of organized and affected minority groups be appropriately represented and articulated. This is such a proper case.

While there is no parallel between the present applicants and those individuals whose interests were vulnerable to adverse testimony before

the Marshall Inquiry, it is arguable that there is some similarity between the parties referred to in subparagraphs (a) and (b) above and the present Applicants.

There is, however, a strong similarity between the Applicant group herein and the group of parents who were granted participant status in the Royal Commission of Inquiry into Certain Deaths at the Hospital for Sick Children and Related Matters conducted by Mr Justice Grange who made the following statement on the issue of participant funding:

I want to say a word about funding. Some of the parties represented are well able to look after themselves financially and with them, we are not concerned. There are those who have a legitimate interest and who are not so able and, where appropriate, I intend to make recommendations for funding of their legal expenses by the Provincial Government.

Chief Justice Parker who conducted the Commission of Inquiry into the Facts of Allegations of Conflict of Interest Concerning the Honourable Sinclair M. Stevens commented favourably on the decision of Mr Justice Grange with regard to the funding of the legal costs for the parents of deceased children in the course of his own ruling regarding the funding of parties as follows:

Then, again, there are counsel here who have standing because they are interested in the Commission, but they do not act for parties that are being affected or may be affected.

The two that have asked for funding are in the last category. They are not acting for parties that may be directly affected by the outcome in the sense that Mr. Stevens is. It is true that, on occasion, funding has been granted to parties. In certain circumstances funding may be justified. A clear case, it would seem to me, would be the inquiry into the Hospital for Sick Children where certain persons were funded for their costs.

It is my view that the position of the Applicant group before me is completely analogous to that of the parents of the deceased children involved in the Grange Inquiry. It is beyond dispute that the Air Ontario crash survivors and the victims' personal representatives have a direct and legitimate interest in the conduct of this Inquiry.

Furthermore, they can claim, as in fact they do, to represent the point of view of at least a segment of the travelling public on the dual issues of airline operations and flight safety, both of which are within the purview of this Commission. It is arguable that they have a contribution to make to this Inquiry from that perspective and it is impossible to

exclude the possibility that this group may raise an issue which others have overlooked notwithstanding due diligence.

In my opinion, it would be manifestly unfair to exclude them from the process of this Inquiry by reason of impecuniosity. To hold otherwise would be to reduce the grant of special participant status to the Applicants to a hollow victory indeed.

It is, in my view, in the public interest that they be included in the process.

I subscribe to the comments of the Commission in the Marshall Inquiry contained in its decision of May 14th, 1987, with respect to the question of funding of various parties which comments are to be found at page 1 of the decision:

However, we do believe that, absent any prohibition, it is implicit in the Terms of Reference of any Royal Commission that it has the capacity, and indeed the obligation, to respond to any party who has been granted standing and who raises an issue of participant funding. To refuse to respond to such a request would be inconsistent with a tradition of Royal Commissions, a tradition which encourages full participation in a public and independent forum. In recent times similar requests have been responded to by then Mr. Justice Berger, Mr. Justice Grange, Mr. Justice Estey and Mr. Justice Parker.

It is also noted that in the matter of the recently concluded Code Inquiry in Alberta into the affairs of the Principal group of companies full funding of legal costs at public expense was granted to a large group of investors who were given participant status with representation by one counsel acting on behalf of the collective group.

Entirely apart from the evidence before this Commission indicating the inability of the Applicant group to finance the costs of representation by legal counsel at the hearings of this Commission, I would deem it in the public interest for the other reasons already stated that this collective group of survivors and the victims' families receive assistance with their legal costs incurred with respect to appearances at the Inquiry.

I will, therefore, recommend to the Governor in Council the payment of reasonable legal costs of counsel representing them including necessary disbursements.

Taking into consideration the fact that Commission counsel have the primary responsibility of presenting before this Inquiry all relevant evidence gathered by the investigators acting under my direction and perceiving the role of counsel for the Applicant group to be in the nature of a less onerous interest role and being conscious of the fact that public funds are involved, I think it appropriate to fix the extent of assistance

with respect to legal fees and expenses to be recommended for counsel on behalf of the Applicant group as follows:

- (a) Counsel fees are to be calculated at an hourly rate on the basis of the fee schedule in use by the Government of Canada for outside legal counsel.

Firstly, the hours for which counsel shall be entitled to assistance shall be the total of the hours actually spent by the representative counsel of the Applicant group at the hearings of this Commission.

And secondly, recognizing that preparation time is a necessary element of counsel work, I direct that counsel for the Applicant group shall be entitled to compensation for a maximum of one hour of preparation time for each hour actually spent at the hearings of the Commission.

- (b) The travel and living expenses of counsel representing the Applicant group incurred while attending hearings of the Commission shall be reimbursed on the same basis as the expenses of Commission counsel under the current guidelines of the Government of Canada.
- (c) The reasonable and necessary disbursements incurred by counsel in the course of representing the Applicant group.

In the event that such funding is approved by the Governor in Council, I deem it appropriate to direct that counsel for the Applicant group shall present detailed statements of accounts on a monthly basis for approval by the secretary to the Commission or by the Commissioner or his designate.

In addition, I direct that no extraordinary expenditures shall be undertaken by counsel for the Applicant group without obtaining the prior approval of the secretary of the Commission or by the Commissioner or his designate.

Finally, I would say that I have reduced my reasons for decision to writing, in both English and French versions, and the written reasons are available for any interested parties.

(Transcript, vol. 10, pp. 9-23)

3 Ruling Regarding Admissibility of Evidence on Pilot Attitudes and Aviation Safety Concerns. The Objectives of Cross-Examination. (September 26, 1989)

THE COMMISSIONER: During the hearings yesterday afternoon, agreeing with objections raised by Mr Jacobsen and Mr Keenan, I ruled that hearsay evidence pertaining to the reputation for competency of First Officer Mills, where such evidence was tendered as proof of the

truth of the subject matter, itself, was inadmissible. I have not retreated from that view.

However, this morning Mr Jacobsen, counsel for Air Ontario, and Mr Keenan, counsel for CALPA, have joined in objecting to both the manner of cross-examination and the content of the cross-examination of Captain Berezuk, the witness presently on the witness stand, being conducted by Mr Bailey who is the counsel for the chief coroner of Ontario.

Mr Jacobsen perceives Mr Bailey's manner of cross-examination to be objectionable. He describes it to be discourteous and of a badgering nature. I will deal with that issue first.

While one might say that Mr Bailey's manner of cross-examination is vigorous, I would certainly not characterize it as discourtesy; nor do I consider Mr Bailey to be badgering the witness.

He is entitled to point out inconsistencies in the evidence, if there are any, and also to test the credibility of the witness. I do not equate such a legitimate objective of cross-examination as badgering.

It is my view that it is important to know whether there is some sort of unwritten rule or code of honour or attitude or accepted blind trust among airline pilots that prevents professional pilots who are, themselves, passengers on commercial flights from communicating their urgent flight safety concerns to the cockpit crew even at a time of perceived danger.

Furthermore, it is important to know whether this is what influenced or constrained this witness from communicating his own obvious concerns to the cockpit crew of the F-28 which crashed.

This is a legitimate area of concern for this Inquiry from the point of view of aviation safety, the subject which clearly is within the terms of reference establishing this Commission. If there is a subtle form of peer pressure or intimidation or even simply a professional attitude among pilots which discourages the communication of perceived dangerous situations by a pilot/passenger to the cockpit crew, then the larger public interest requires that this be examined.

A full airing of issues potentially impinging on the larger question of aviation safety is, in my view, more important than the preservation of the niceties of evidentiary rules by which a Commission of Inquiry in any event is not bound.

It is, therefore, my ruling that Mr Bailey may proceed with his cross-examination.

(Transcript, vol. 15, pp. 48–50)

4 Ruling Regarding Prejudicial Effect of Adverse Evidence and Air Ontario's Application to Call Witness out of Sequence – Inquiry Procedure – Ongoing Investigation (November 20, 1989)

THE COMMISSIONER: At the conclusion of proceedings on Friday afternoon last, Mr Jacobsen, counsel for Air Ontario, made application for a direction to Commission counsel to call as a witness out of sequence one Wayne Copeland, an employee of Air Ontario at its London, Ontario, SOC headquarters.

Mr Copeland, it is indicated, was the person at the London, Ontario, SOC office of Air Ontario who spoke on the telephone with Captain Morwood shortly prior to the departure of flight 1363 from the Dryden airport on March 10, 1989.

The object of the application as outlined by Mr Jacobsen is to end speculation, which he alleges is occurring in the media and among the public, as to the contents of the telephone conversation in question.

It is contended that the evidence that has been heard from several witnesses, who variously described Captain Morwood's demeanour after this telephone conversation as being one of either anger or upset, is prejudicial to Air Ontario and that fairness requires that Air Ontario be permitted to have Mr Copeland called at this stage of the proceedings instead of at the planned hearings of the Commission either in late January or February of 1990.

Mr Jacobsen urged that it would be simple and a non-time-consuming matter to have Mr Copeland inserted as a witness at this stage of the proceedings. He estimated that only 15 minutes would be needed to put in Mr Copeland's direct evidence.

This time estimate, of course, does not take into consideration the time which various counsel will require for cross-examination of Mr Copeland. One of these counsel has already informed Commission counsel that he will require at least one half day for cross-examination of Mr Copeland.

While on the face of it the application appears to be innocuous, a careful consideration of all the factors involved reveals a number of additional areas of concern, some of which were raised by Commission counsel, Mr von Veh, and by Mr Bailey, counsel for the chief coroner of Ontario, both of whom argued against the application.

Mr von Veh pointed out that Commission counsel, who has the responsibility for the order of calling of witnesses, has a pre-planned sequential program for the introduction of evidence pursuant to which he anticipates dealing with the area of evidence involving Mr Copeland in the new year, calling Mr Copeland now would be out of context and seriously disruptive to the planned schedule; moreover, there is an investigation by the Ontario Provincial Police still ongoing concerning

Captain Morwood's telephone call or calls from the Dryden airport terminal.

It is indicated by Commission counsel that it has been established by the Ontario Provincial Police investigation thus far that Captain Morwood spoke on the telephone to at least one other person at the Air Ontario SOC offices besides Mr Copeland on March 10th and that calling Mr Copeland now would prejudice that ongoing investigation. In my view, this alone is sufficient reason to deny the application.

There are, however, other cogent reasons for doing so. There is evidence already on record which some parties other than the Applicant could perceive to be adverse to their interests. Probably there will be more. That being the case, I am of the view that to allow this application would set a troublesome precedent which could conceivably cause chaos to the proceedings of this Inquiry by unleashing demands by other parties adversely affected by the testimony of a particular witness that they then and there be permitted to call a witness to respond to such adverse testimony.

This is not a privilege enjoyed even by persons accused of a serious criminal offence. Although a commission of inquiry is not to be equated with a criminal trial, a comparison with criminal procedure is instructive. Criminal trial procedure in our system of justice does not permit an accused to take the stand during the course of the presentation of evidence by the Crown in order to refute adverse testimony arising during presentation of the Crown's case.

It seems to me that a party at an inquiry under the *Inquiries Act* who perceives that certain evidence is adverse to that party is hardly entitled to a privilege not extended to an accused who is prejudiced by adverse testimony and whose personal liberty in fact may be at stake.

Having regard to all the circumstances, it is my view that the potential prejudicial effects upon the conduct of the Inquiry of allowing the application in question far outweigh any perceived prejudice to the interests of the Applicant.

The concept of fairness requires that the party adversely affected by evidence be given full opportunity to respond to adverse testimony. That principle was recognized from the very first days of this Commission. The Applicant will be given full opportunity to do so but at the appropriate time. The application is therefore dismissed.

(Transcript, vol. 26, pp. 1-5)

5 Ruling Regarding Testimony of Pilots with Respect to Confidentiality of Pilot Surveys – Claim for Privilege – Exclusion of Witnesses (May 22, 1990)

THE COMMISSIONER: Well, I will deal with that point first. It strikes me that there is really no analogy between the position of these pilots and a party accused in a criminal matter and a party in a civil action. I don't think I can come to the conclusion that you suggest, Mr Keenan, with respect to the pilots.

In this matter, it is not in dispute that five Air Ontario F-28 pilots gave certain information to their safety officer, Captain Stewart, after the March 10th crash at Dryden and that Captain Stewart recorded this information.

Commission counsel proposes to call Captain Stewart and the five pilots in order to establish the circumstances under which the information was given to Captain Stewart by these pilots, and he argues that those circumstances are relevant to the larger issue of privilege based on confidentiality which is being asserted on behalf of those pilots with respect to that information.

This is a two-stage issue. The first stage involves the circumstances out of which a claim for privilege based on confidentiality arises. The second stage involves examining the issue of whether or not a claim for privilege can be sustained on the basis of confidentiality. At this point, we are concerned only with the first stage.

Counsel for Air Ontario and for the Canadian Air Line Pilots Association representing the five pilots argue that the pilots who gave statements to Captain Stewart should not be called as witnesses at this stage, nor should their identities be made public prior to a decision being made on the larger issue of privilege itself. It is suggested that I hear only the evidence of Captain Stewart on this point. However, to hear the evidence of Captain Stewart alone would be to only hear one side of the story.

The question is not so much one of whether an offer of confidentiality was made but whether that information which was received by Captain Stewart would not have been given to him by the pilots in question in the absence of an undertaking as to confidentiality.

The available jurisprudence on the subject indicates that a tribunal faced with a claim of privilege on the basis of confidentiality must hear evidence as to the circumstances giving rise to such claim. In this case, I can think of no evidence more germane to the issue of such circumstances than that of the five individuals with respect to whom a claim for privilege is being asserted on the basis of confidentiality.

The circumstances under which the statements in question were given go to the very heart of the matter. That evidence can only be given by

the pilots themselves. Position statements made by counsel on their behalf is not evidence.

In short, in order to intelligently adjudicate on the main issue, I feel that I have to hear those who claim privilege and their evidence must be subject to the tests of cross-examination.

At this stage, no reference to the content of the actual statements given by each of the pilots will be made. It is already public knowledge that certain statements were made.

In my view, it cannot reasonably be inferred that any injury will accrue to these pilots or to the general pilot group by merely hearing the evidence of the five pilots as to the circumstances under which their individual statements were made to Captain Stewart.

I therefore conclude in all the circumstances of this case that it is appropriate that Captain Stewart and the five pilots be called as witnesses in this stage of the process of ultimately determining the efficacy of the claim for privilege.

Counsel for the chief coroner of Ontario has moved that there be exclusion of witnesses during this phase of the Inquiry. This is routinely done in courts at all levels. Because of the delicate nature of this matter, I deem it to be in the best interests of all concerned, including the said pilots themselves, that an order for exclusion be made.

I accordingly make the following order. First, all witnesses who are to be called to testify in this phase of the Inquiry shall be excluded from the hearing room while other witnesses testify. Second, witnesses who are yet to be called to testify are hereby directed not to watch the television monitor at Commission premises during the hearings. Third, witnesses who are to be called shall not discuss their evidence or the evidence of any other witness with any other person excluding counsel for those persons.

Witnesses who are yet to be called to testify are directed not to read the transcripts of evidence given by other witnesses who have testified ahead of them during this phase of the Inquiry.

I think that takes care of it.

(Transcript, vol. 74, pp. 72–76)

6 Ruling Regarding Application for Exclusion of Witnesses – Several Individuals To Be Examined on Specific Subject with Respect to Which They Gave Previous Statements Separately (August 14, 1990)

THE COMMISSIONER: Well, having heard the arguments both pro and con, I am of the view that this particular situation can be distinguished from any other situation that we have faced to the present point in time.

We have here a small group of individuals who apparently will be testifying on a very specific area, with respect to which they gave statements separately. I think it's in the general interest of all concerned that the application should be granted. I see no reason why aspersions of any sort should be cast upon the group of individuals who will be testifying by reason of the fact that they will be excluded while the evidence is being heard.

It's very common, as has been pointed out by Mr Friesen – I think he summed it up very well – for witnesses to be excluded during the course of trials, both civil and criminal, and no connotations or aspersions are cast upon a group of witnesses who are so excluded in those situations, and I don't see why it should happen here. I think it's in their own interest as well as the general interest that the application should be granted, and I am going to make that order.

(Transcript, vol. 91, pp. 10–11)

7 Ruling Respecting Admissibility of Witness Pre-Hearing Interview Transcripts for Purpose of Cross-Examination of Interviewee – Question of Privilege (September 20, 1990)

THE COMMISSIONER: During the adjournment, I have reviewed those sections of the transcripts of the interview conducted with Captain Deluce which are alleged to contain statements which are inconsistent with what he said in his viva voce evidence on the witness stand.

In addition, I have considered the question of whether there is any sort of privilege to be attached to the transcripts which were produced of the interviews. It has been suggested by Mr MacDougall and Mr Keenan in particular that there was some sort of understanding that these statements would not be used in any proceeding before this Commission.

I have spoken to those Commission counsel who were present during the interview with Captain Deluce, and they indicate to me and my understanding of their view of the situation was that any statements which might have been perceived to grant some sort of privilege to the witness statements during the interview were in fact directed in the minds of Commission counsel specifically to certain personal problems which were drawn to their attention by Mr Deluce's counsel. And I certainly would not expect any of those statements to become any part of the public record.

However, on further examination of the record, I also noted that Mr Jacobsen at volume 1 of the transcript – and Mr Jacobsen was counsel representing Captain Deluce – made a statement:

This is an intimidating process for him, rightly or wrongly, and what I wanted to – I wanted to put that on the record in hopes that people would be understanding when we are looking at this.

Now, this, in my mind, equates with an expectation that indeed this was a record and that it might be looked at in the future. There, it is noted, were objections by counsel from time to time regarding certain questions. The interview went both on and off the record at times.

And having regard to all of this evidence, it is my view that it would not be in the public interest to prevent the witness from being asked to explain certain inconsistent statements, if there were inconsistent statements, made by him during the course of the interview.

Now, with respect to the question of whether or not there were inconsistent statements made by this witness insofar as what he has told us on a viva voce basis on the witness stand is concerned, I have perused in volume 2 of the transcripts, pages 309 and 310 in particular – these were the passages which are cited to me as being the passages in contention.

And I, having read those passages, am of the view that there clearly was an inconsistent statement made during the course of the interview with respect to the wing check relating to the speed at which it was conducted as compared to what the witness has said on the witness stand.

That being the case, I deem it entirely appropriate that the witness should be called upon to explain the inconsistency. I think he should be given that opportunity, from his own point of view, and I think it is desirable in the public interest as well.

(Transcript, vol. 113, pp. 106–109)

8 IN THE MATTER OF the Commission of Inquiry into the Air Ontario Crash at Dryden, Ontario ("the Commission")

AND IN THE MATTER OF PART I of the Inquiries Act, R.S.C. 1985, c.I-11, s.13

AND IN THE MATTER OF an application before Commissioner Virgil P. Moshansky made by Paterson, MacDougall on behalf of Air Ontario Inc. and ten individuals ("the Applicants")

An in camera hearing was held before me on Wednesday, October 9, 1991, at which time representations were made to me by D. Bruce MacDougall, Q.C., Mr. Peter M. Jacobsen, and Mr. Gerard A. Chouest of the firm Paterson, MacDougall, counsel to the Applicants. Also in

attendance were Commission Counsel, F.R. von Veh, Q.C, and Assistant Commission Counsel, Mr. Laurence C. Goldberg.

I will briefly set out the background and the issues that gave rise to the October 9, 1991, in camera hearing.

This Commission of Inquiry is established pursuant to Order in Council PC-1989-532 and Part I of the *Inquiries Act*. Accordingly, this Commission is bound by the Order in Council that requires me:

... to inquire into the contributing factors and causes of the crash of Air Ontario Flight 363 Fokker F-28 at Dryden, Ontario, on March 10, 1989, and report thereon, including such recommendations as the Commissioner may deem appropriate in the interests of aviation safety.

On August 19, 1991, Commission Counsel forwarded, by registered mail, letters of notification to, among other organizations and individuals, the Applicants.

As well, copies of all the letters were delivered to their counsel, Mr. D. Bruce MacDougall, on August 19, 1991. I should explain at the outset the role of Paterson, MacDougall and other counsel in this inquiry.

Throughout the hearings before me, a lawyer from Paterson, MacDougall attended every day of the hearings when an Air Ontario witness was being questioned. At times there were two Paterson, MacDougall counsel present, at times a counsel from another law firm assisted, and very frequently a senior executive from Air Ontario assisted counsel who appeared before me. Furthermore, Paterson, MacDougall had transcripts of proceedings supplied to it on a daily basis. Moreover,

- Before any witness testified, a synopsis of such witness's anticipated testimony, based on witness interviews, was forwarded to all representative counsel, including Paterson, MacDougall.
- Before any witness testified, photocopies of all exhibits proposed to be introduced through a given witness were forwarded to all representative counsel, including Paterson, MacDougall.
- All representative counsel appearing before me, including Paterson, MacDougall, were afforded broad rights of cross-examination of all witnesses.
- All representative counsel, including Paterson, MacDougall, were afforded the right to file written briefs as they saw fit, for my consideration.
- All counsel appearing before me, including Paterson, MacDougall, were afforded the opportunity to call such further evidence as they saw fit, in addition to the evidence called by Commission Counsel.

Paterson, MacDougall chose not to call any evidence other than through one witness, Constable E.A. Grenier of the Ontario Provincial Police.

- All counsel appearing before me, including Paterson, MacDougall, were afforded the opportunity to present closing arguments.

The hearings ended on January 24, 1991. Since that time I have been engaged in sifting through the evidence and formulating my analysis and potential findings and conclusions.

The August 19, 1991, letters forwarded by Commission Counsel, on my direction, to a number of organizations and individuals contained the following provision:

Section 13 of the *Inquiries Act* states that:

No report shall be made against any person until reasonable notice has been given to the person of the charge of misconduct alleged against him and the person has been allowed full opportunity to be heard in person or by counsel.

This letter shall constitute notice that the Commissioner will hear and consider any submissions that you or your counsel may wish to make in relation to adverse findings made against you. Although the *Inquiries Act* addresses a "charge of misconduct", in the interest of fairness, Commissioner Moshansky has directed that notice be afforded to all persons against whom he may make adverse findings. The Commissioner has advised me that he does not view the findings enumerated below as constituting "misconduct" within the meaning of Section 13 of the *Inquiries Act*.

The substance of the intended findings adverse to ... [named organization or individual] ... are that, at material times ...

By correspondence dated August 30, 1991, from Mr. MacDougall to Commission Counsel, further information and particulars were sought.

By letter dated September 6, 1991, Commission Counsel responded to Mr. MacDougall's correspondence by forwarding a 13-page letter of particulars.

By correspondence dated August 29, 1991, one Applicant, a recipient of an August 19, 1991, letter from Commission Counsel, wrote to Commission Counsel advising of a desire to submit written representations to the Commission. That Applicant's written representations, dated September 8, 1991, were in fact forwarded to Commission Counsel by facsimile transmission on September 9, 1991.

Two letters, both dated September 13, 1991, were forwarded by Mr. MacDougall to Commission Counsel, setting out representations relating to Section 13 and again requesting further particulars.

By correspondence dated September 26, 1991, Commission Counsel forwarded a 66-page letter to Mr. MacDougall addressing various issues raised in the two September 13, 1991, letters above noted, including a detailed elaboration of particulars. Mr. MacDougall was further advised to the following effect:

Should you take issue with any of the foregoing, or wish to comment thereon, the Commission will entertain your further written representations on or before Monday, October 6, 1991, or hear your *viva voce* submissions in camera, but on the record, on Wednesday, October 9, 1991 at 9 a.m. in the boardroom located at the Commission's offices. Should you wish to make *viva voce* submissions, the Commissioner has requested that a brief written summary of such submissions be delivered to the Commission offices by 12:00 noon on Tuesday, October 8, 1991.

By correspondence dated October 4, 1991, Mr. MacDougall wrote to Commission Counsel. This letter, received at the Commission's offices on the afternoon of Friday, October 4, 1991, is hereafter set out in full.

Dear Sir: ...

Thank you for your letter of September 26, 1991.

We have taken note of the options set out at page 65 of your letter and wish to inform you that we shall be making *viva voce* submissions before the Commissioner on October 9, 1991 and, in accordance with your request, shall provide a brief written summary of those submissions by 12:00 noon on October 8, 1991. As we expect you will be opposing, we should request a written summary, by 5:00 p.m. on the 8th, of any points you intend to raise beyond those set out in your letter of September 26, 1991.

In general terms, we shall be submitting that the Commissioner cannot properly make a report of misconduct against any of the persons referred to in your letters to us.

In addition, we shall also be submitting, in any event, that the notice of the charges of misconduct as contained in your letter of September 6, 1991, as expanded by your letter of September 26, 1991, falls short of being reasonable notice.

Although we and our clients are anxious for this matter to be concluded, we must point out that if the Commissioner rules against us on the names issue, even leaving aside a possible judicial review, it will be necessary for us to make a formal request for a further extension of time for response, as we will be advising all of the named persons of their right to retain counsel independent of Air Ontario, as their personal position could conflict with that of the company.

In addition, apart entirely from the names issue, we shall be requesting additional time to respond, on proper notice, to the charges.

Please let us know if these arrangements are satisfactory.

Yours very truly,
D. Bruce MacDougall

Commission Counsel responded to the above-noted October 4, 1991, correspondence on Monday, October 7, 1991. The response is hereafter set out in full.

Dear Mr. MacDougall: ...

I thank you for your letter of October 4, 1991.

Please be advised that the position of Commission Counsel is set out in my correspondence of September 26, 1991. Accordingly, I do not at the present envision the necessity of raising any further points before the Commissioner on October 8, 1991.

In paragraph two (2) of your noted correspondence you state:

"In general terms, we shall be submitting that the Commission cannot properly make a report of misconduct against any of the persons referred to in your letters to us."

It is reiterated that the various observations and findings proposed to be made by the Commissioner are not viewed by the Commissioner as constituting "misconduct" as that term is used in section 13, but rather, either are or could be construed to be adverse findings, which were communicated in the interest of fairness.

I have forwarded a copy of your October 4, 1991 correspondence to the Commissioner, and look forward to seeing you on Wednesday, October 9, 1991 at 9:00 a.m. and also receiving your written summary of submissions to be made by 12:00 noon on Tuesday, October 8, 1991.

Yours very truly,
F.R. von Veh

After the above-noted sequence of events, an in camera hearing was convened by me in the boardroom of the Commission offices on Wednesday, October 9, 1991, at 9:00 a.m.

The Applicants' position may be summarized as follows:

1. that I cannot properly make a report of misconduct against any of the persons who were recipients of the August 19, 1991, letters;

2. that I should make findings and observations only of a generic nature, without naming any individuals;
3. that reasonable notice has not been afforded to the recipients of the August 19, 1991, letters to enable them to respond properly; and
4. that, should I name individuals, then more time is required to enable Paterson, MacDougall to advise all recipients of the August 19, 1991, letters of their right to retain independent counsel since their personal interests could conflict with those of Air Ontario Inc.

These four points were supported by reference to the *Inquiries Act*, the case law, and the *Canadian Charter of Rights and Freedoms*, s.7.

Having regard to all of the circumstances, the exhibits filed before me, and the argument advanced by counsel, I will now deal with the above-noted four points.

Reporting Misconduct

When Commission Counsel first raised with me the question of communicating with certain individuals who might be expected to be named in my Report, it was my view that the various observations and findings I had under consideration would not constitute charges of misconduct as that term is used in Section 13. I viewed such proposed observations and findings as being, at most, adverse findings. However, in order that all persons potentially affected by such adverse findings be treated fairly, I directed Commission Counsel to notify all potentially affected persons of the observations and findings that I proposed to consider in order that they could avail themselves, if they desired, of a further opportunity to be heard. On August 19, 1991, Commission Counsel wrote to, among other individuals and organizations, Air Ontario Inc. and the ten individuals named herein, setting out the adverse findings that I considered could be made against them. As stated earlier, this correspondence contained the following provision:

Although the *Inquiries Act* addresses a "charge of misconduct", in the interest of fairness, Commissioner Moshansky has directed that notice be afforded to all persons against whom he may make adverse findings. The Commissioner has advised me that he does not view the findings enumerated below as constituting "misconduct" within the meaning of section 13 of the *Inquiries Act*.

Accordingly, in view of the fact that I do not propose to make "charges of misconduct" within the meaning of Section 13 of the *Inquiries Act*, the factual basis does not exist for counsel's first point and I need not consider it further.

Generic Findings without Naming Individuals

In the earliest stages of this Commission, I consulted with internationally recognized experts in the field of aviation accident investigation. I concluded, on the basis of these consultations, that, in order to conduct a thorough investigation into an airline accident such as this, it was necessary to examine all operational elements which could potentially have a bearing on the accident. Internationally accepted standards of aviation accident investigation required an examination of, among other things, the flight crew, the aircraft and its systems, the infrastructure immediately involved in the aircraft operation leading up to the accident, the air carrier, and the regulator. Only in this way could all of the contributing factors and causes of an airline crash be properly determined.

At the first formal public hearing on June 16, 1989, I outlined my interpretation of the terms of reference of the Inquiry:

I interpret the terms of reference to provide a broad mandate to inquire not only into the Air Ontario crash but also into any derivative matters which affect aviation safety, with respect to which I am directed to make such recommendations as I may deem appropriate. The Commission may, from time to time, enlarge, consolidate, delete, and/or modify any of the said areas of inquiry as the evidence unfolds.

Evidence was adduced from 166 witnesses, resulting in an evidentiary record consisting of approximately 34,000 transcript pages and approximately 177,600 pages of exhibits and related documentation.

I am obligated to report to the Governor in Council on my observations and findings based on the evidentiary record before me. To discharge this mandate and to make meaningful recommendations in the interests of aviation safety, it is necessary that such findings and recommendations be supported by an analysis of specific evidence before me. In my view, a proper analysis of the "contributing factors and causes of the crash of Air Ontario Flight 363" requires observations and findings adverse to some organizations and individuals to be made.

In my view, I would be remiss in carrying out my mandated duties as specified in the Order in Council dated March 29, 1989, if I did not specifically name organizations or individuals, where appropriate, to lend clarity to the narrative of events and to identify clearly and without ambiguity the particular events that in my view contributed to the crash, or that give rise to my specific recommendations concerning aviation safety.

To refer only to nameless and unspecified individuals could do an injustice by casting a cloak of doubt over the conduct of other individ-

uals, who are blameless, and others who did not have the opportunity to appear before me and be heard. This I am not prepared to do.

In my view there is no conflict between the way in which I propose to fulfil my terms of reference and the requirements of natural justice, or, in *Charter* terms, the requirements of fundamental justice.

In considering the argument advanced on this second point, I have reviewed all of the cases referred to, and in particular *Re Nelles et al. and Grange et al.* (1984) 9 D.L.R. (4th) 79 (Ont. C.A.) (hereinafter "*Nelles*"); *Re First Investors Corporation Ltd.*; *Re Associated Investors of Canada Ltd.* (1988) 58 Alta. L.R. (2d) 39 (Alta. Q.B.) (hereinafter "*First Investors*"); and *Robinson v. R.* (1986) 4 W.W.R. 729.

In *First Investors*, an inspector was appointed pursuant to the *Alberta Business Corporations Act*, S.A. 1981, c.B-15, to inquire into the dealings of two corporations. Public hearings were conducted by the inspector, and one of the principals of the subject corporations made application to the Court seeking an order, the effect of which would limit the inspector in the conduct and reporting of his investigation. Mr. Justice Berger of the Alberta Court of Queen's Bench rejected the applicability of the *Nelles* case to the Alberta inspector's investigation. The judgement at page 59 states:

The applicant relies, in part, upon the pronouncement of the Ontario Court of Appeal in *Nelles v. Grange* (1984) 42 C.P.C. 109 9 D.L.R. (4th) 79, 3 O.A.C. 40. The decision of the Ontario Court of Appeal is premised, in part, on the notion that (at p. 89):

... if no charge is subsequently laid, a person *found responsible* by the commissioner would have no recourse to clear his or her name [my emphasis].

In the case at bar the inspector's mandate is to investigate. I have held that he is not authorized to fix criminal liability. While evidence of criminal activity may emerge, the investigation neither usurps nor undermines the function of the judicial process in the ordinary courts.

In the proceedings to date, the inspector has, in keeping with the principles of fundamental justice, allowed the applicant the right to be represented by counsel and the right to cross-examine witnesses. The applicant does not submit that there is evidence of procedural unfairness. His argument appears to be prospective in nature. In that respect, the observations of Legg J. in *Robinson v. B.C. (Govt.)*, [1986] 4 W.W.R. 729, 3 B.C.L.R. (2d) 77, 28 C.C.C. (3d) 489 (sub nom. *Robinson v. R.*) (S.C.), at p. 747 are of assistance.

I agree with counsel for the Attorney General that the commission of inquiry appointed by the Order in Council is a recom-

mentary, not an adjudicative, body. It will report findings to the Lieutenant Governor in Council. It will make no determinations as to guilt or innocence or civil or criminal liability. It cannot terminate the employment of or otherwise discipline any person. Nor will its report necessarily lead to any subsequent proceedings against anyone. That being so, it cannot be said that the inquiry will deprive any person of liberty or security of the person ... "

In support of their submissions, counsel for the Applicants relied on the *Nelles* case, as had been done by the applicant in *First Investors*.

I am unable to accept such a submission.

Every commission of inquiry is governed by its own terms of reference. The terms of reference of the instant investigative and recommendatory Commission of Inquiry mandated me:

... to inquire into the contributing factors and causes of the crash of Air Ontario Flight 363, Fokker F-28 at Dryden, Ontario, on March 10, 1989, and report thereon, including such recommendations as the Commissioner may deem appropriate in the interests of aviation safety.

The terms of reference of the *Nelles/Grange* inquiry specifically precluded the commissioner of that inquiry from making findings of civil or criminal responsibility. While I have no intention of assigning criminal or civil liability, the terms of reference of this Commission contain no such limitation. In my judgement, my terms of reference not only contemplate, but, having regard to the record of evidence before me, require that I make findings of fact that may be regarded as critical or adverse.

I am dealing with a crash that resulted in the death of 24 individuals. The record indicates that the crash did not occur free of human, corporate, and regulatory error. I intend to report my findings fairly and accurately. I cannot do so without identifying the individuals, corporations, and organizations in question. Counsel for the Applicants acknowledged in argument that it would be appropriate "to name" the pilots of C-FONF. I do not see any rational basis on which to limit the "naming of names" in this way. All individuals and regulatory and corporate entities involved in this Commission have been afforded to the full the benefit of the principles of fundamental justice.

For these reasons, I am not prepared to make observations and findings of only a generic nature without naming any individuals. Individuals will be named in observations and findings in cases where the evidentiary record and the discharge of my mandate so warrant.

I might also point out that the *Nelles/Grange* inquiry was established pursuant to the Ontario *Inquiries Act*, while the instant Commission of Inquiry is established pursuant to the federal *Inquiries Act*. This fact negates the necessity of addressing the constitutional issues that were so important to the disposition of the issues before the Ontario Court of Appeal in its consideration of the procedures of the *Nelles/Grange* inquiry.

The Issue of Reasonable Notice

Counsel for the Applicants argued that the recipients of the August 19, 1991, letters have not had sufficient particulars or time to respond properly to the proposed adverse observations and findings. I do not agree with this submission. With respect to particulars, Commission Counsel's 66-page letter of September 26, 1991, provided Paterson, MacDougall with notice in considerable detail of the points and the circumstances that may give rise to an adverse finding in my eventual Report. Counsel for the Applicants have access to the full evidentiary record, and their day-to-day participation in the Inquiry, together with Commission Counsel's 66-page letter, can leave them in no doubt about the issues that must be addressed. In the present application, Paterson, MacDougall intimated that nothing less than my report in draft form would satisfy their requirements. The request, in my view, indicates the extent to which the Applicants have misconstrued the limits of procedural fair play and fundamental justice.

With respect to the issue of timing, the following chronology is of significance:

- (a) The August 19, 1991, letters were sent by registered mail to 11 persons. Each notice contained the following notification concerning timeliness:

Please consider this letter as official notice pursuant to the provisions of section 13 of the *Inquiries Act*, and advise the Commission in writing on or before Tuesday, September 3, 1991, if you wish:

1. to be heard in person or by counsel;
2. to be heard by means of written submissions; or
3. not to be heard by the Commission.

SHOULD YOU NOT RESPOND ON OR BEFORE TUESDAY, SEPTEMBER 3, 1991, IT WILL BE TAKEN TO MEAN THAT YOU HAVE WAIVED YOUR RIGHT TO BE HEARD PURSUANT TO THE INQUIRIES ACT, SECTION 13.

It is to be noted that submissions presented pursuant to this procedure will be carefully considered by the Commissioner in preparation of his Final Report. Written submissions are to be received by the Commission on or before **TUESDAY, SEPTEMBER 10, 1991.**

Only one Air Ontario witness wrote to Commission Counsel and made written submissions as requested in the August 19, 1991, letter.

- (b) A copy of each August 19, 1991, letter was delivered to Mr. Bruce MacDougall on August 19, 1991. By correspondence dated August 30, 1991, Mr MacDougall wrote to Commission Counsel requesting more particulars and setting out his position in relation to Section 13. There are two paragraphs of particular significance in this correspondence:

We are writing to you with respect to Section 13 notices you have provided to us as counsel to Air Ontario and to several of the witnesses who gave evidence at the inquiry.

The above information will assist us greatly in preparing our response to the notices that you have provided to us. Obviously the sooner we are in possession of this information the sooner we will be able to respond.

It is clear from reading the letter *in toto* and particularly the two paragraphs quoted therefrom that Paterson, MacDougall was acting as counsel to Air Ontario and to persons employed by Air Ontario who appeared before me.

- (c) Two letters dated September 13, 1991, were forwarded by Mr. MacDougall to Commission Counsel, essentially requesting further particulars. Both letters initially set out the context in which they were forwarded to the Commission:

We are writing this letter as Counsel for Air Ontario Inc., a participant in the Inquiry, and as Counsel also representing the interests of the witnesses ... in response to the Notices of "intended findings" contained in your various letters to them of August 19, 1991.

and

We are writing to you as counsel for Air Ontario Inc. in response to your letter of August 19, 1991 to the president for the company.

Having regard to the role that Paterson, MacDougall assumed in this Inquiry; the degree of specificity of the particulars that were sent to Mr. MacDougall; the passage of fifty-one (51) days from August 19, 1991, to the date of the in camera hearing; and the role Paterson, MacDougall assumed in the Inquiry process by representing the interests of all but a few of the Air Ontario employees in interviews and dealings with the Commission, by representing them at all hearings before me, and by the very correspondence leading up to this application, as earlier noted, I am left in no doubt that all of the persons who were forwarded letters on August 19, 1991, had reasonable and sufficient time to respond to such letters, either individually or through Paterson, MacDougall, the counsel representing their interests.

Counsel for the Applicants argued that there was an unreasonable delay in the service of the letters from the Commission dated August 19, 1991, September 6, 1991, and September 26, 1991, upon the Applicants. In the circumstances, I do not agree. This Commission of Inquiry was constituted on March 29, 1989, hearings commenced on July 17, 1989, and hearings ended on January 24, 1991. Since that time I have been reviewing a vast volume of documents and transcript evidence. The letters to the Applicants were forwarded as soon as I was satisfied with my review of the evidentiary record.

In the interests of fairness to all concerned, notwithstanding my decision set out above, I am hereby granting an extension of time until noon on Thursday, October 24, 1991, by which time the remaining ten persons may make written representations to me concerning the notices such persons were forwarded on August 19, 1991, as amplified by correspondence dated September 6 and 26, 1991. Such representations may be individually sent, as was done by one Applicant, or may be submitted by counsel.

Possible Conflict of Interest in Legal Representation of Individuals

I have given particular consideration to counsel's assertion that individuals may need more time to respond since Paterson, MacDougall "will be advising all of the named persons of their right to retain counsel independent of Air Ontario, as their personal position could conflict with that of the company."

The conduct of Paterson, MacDougall throughout this Inquiry led me to believe that any issues of conflict had been addressed by Paterson, MacDougall and its clients at a very early stage; and further, that such early consideration of such issues resulted in Paterson, MacDougall representing all of the individuals that they purported to represent. I am of the view that Paterson, MacDougall cannot now argue that it is

unable to provide these individuals with independent counsel as the Inquiry draws to a close and delivers its Final Report, after such individuals were interviewed and appeared as witnesses before me represented by Paterson, MacDougall during the investigation phase of this Inquiry.

With respect to the individuals themselves, if any person who received an August 19, 1991, letter from the Commission feels aggrieved by reason of the representation of Paterson, MacDougall and now wishes separate representation, then such persons can come forward before me as individuals to make submissions on Thursday, October 24, 1991.

Charter of Rights

Counsel for the Applicants argued that the procedure proposed by the Commission would violate the individual Applicants' common law right to reputation and their right under Section 7 of the *Charter of Rights and Freedoms* not to be deprived of "security of the person" except in accordance with the principles of fundamental justice. I very much doubt that the "security of the person" of any individual will be put at risk as a result of the Final Report of this Commission of Inquiry. To the extent that "security of the person" may be an issue, there has been and will be scrupulous adherence to the principles of fundamental justice.

For the foregoing reasons the Application is denied.

DELIVERED AT TORONTO, ONTARIO,
THIS 11th DAY OF OCTOBER, 1991.

THE HONOURABLE Mr. JUSTICE
VIRGIL P. MOSHANSKY, COMMISSIONER

FINAL REPORT

TECHNICAL APPENDICES

- 1 Occurrence No. 825-89-C0048: Structures/Site Survey Group Report
LP 38/89: Accident: Fokker F28, Mk 1000, Registration C-FONF, 10
March 1989
Canadian Aviation Safety Board Investigation Team
- 2 Fokker Aircraft B.V. Amsterdam, Fokker Aerodynamics, Report No.
L-28-222: Note on the Aircraft Characteristics as Affected by Frost, Ice
or Freezing Rain Deposits on Wings
- 3 Fokker Aircraft B.V. Amsterdam, Report No. VS-28-25: Flight
Simulator Investigation into the Take-off Performance Effects of Slush
on the Runway and Ice on the Wings of a Fokker 100
- 4 A Report on the Flight Dynamics of the Fokker Mk 1000 as They
Pertain to the Accident at Dryden, Ontario, March 1989
J.M. Morgan, G.A. Wagner, R.H. Wickens
- 5 Wind Tunnel Investigation of a Wing-Propeller Model Performance
Degradation due to Distributed Upper-Surface Roughness and
Leading Edge Shape Modification
R.H. Wickens and V.D. Nguyen
- 6 Freezing Precipitation on Lifting Surfaces
Myron M. Oleskiw
- 7 Human Factors Aspects of the Air Ontario Crash at Dryden, Ontario:
Analysis and Recommendations to the Commission of Inquiry
Robert L. Helmreich





Commission of
Inquiry into the
Air Ontario Crash
at Dryden, Ontario



Commission d'enquête
sur l'écrasement d'un
avion d'Air Ontario
à Dryden (Ontario)

